



Memorandum of Understanding for the

“ALADIN Consortium”



PREAMBLE

ACKNOWLEDGING that an accurate weather forecast is increasingly important to reduce weather related threats to life, health, economy and property;

RECALLING that an ALADIN project is already existing since the early 1990s, and that the associated consortium, under four successive Memoranda of Understanding, has brought the ALADIN community to the forefront in the field of High Resolution Short Range Weather Forecast, through:

1. Concept, definition, development, operation, maintenance of a common and state-of-the-art High Resolution Numerical Weather Prediction limited area system called “ALADIN”;
2. Training, recruitment, motivation and academic rewards of an increasing community of developers and users;
3. Publishing significant scientific achievements in the most recognized international journals;
4. Management, organisation and establishment of principles, objectives and perspectives of increasing performances for a group of members;
5. Collective commitment of human resources to operational and maintenance support, and to joint organisation and management structures;

WISHING to develop their individual capabilities to fulfil their national needs and responsibilities in order to bring the best available quality of service to all users of meteorological services in their countries;

WISHING to optimise the individual and collective contributions of their countries to the WMO programmes;

STRESSING their continuous commitment to the common strategic objective of enabling their respective countries to get the best possible operational forecasting system compatible with their available resources and to access the most advanced mesoscale modeling capabilities for research purposes;

RECOGNISING, however, that resource constraints may limit their individual ability to fully run and exploit the most advanced mesoscale system, and that, therefore, this common strategic objective can only be met through a flexible approach taking into account the range of these constraints;

RECOGNISING that the maintenance and further development of state-of-the art mesoscale forecasting models require substantial investments, in particular in terms of human resources, and that such tasks and investments are better shared for mutual benefit;

WILLING to face collectively the challenge of providing the best possible weather forecast services with optimised human and financial resources in their shared ambition of being the national excellence and an international reference in meteorology;

WISHING to continue and expand the successful activities of the ALADIN Programme in the field of High Resolution Short Range Weather Forecast by developing the science, the know-how, the expertise and the use around a common High Resolution Limited Area Numerical Weather Prediction System;



PROVIDING help to various other fields of interest such as nowcasting, regional climate, marine forecasting, pollutant transport forecast and so on;

WISHING to work together with the HIRLAM consortium with the objective of forming a single consortium at the latest by the end of 2020, as stated in the joint resolution of the ALADIN General Assembly and the HIRLAM Council adopted on December 2, 2014;

RECOGNISING the existence of the ALADIN-HIRLAM cooperation agreement signed on December 1, 2010;

CONFIRMING their commitments to implement the WMO Resolution 40 (Cg XII);

RECOGNISING the possibilities of a wider European collaboration between Numerical Weather Prediction (NWP) consortia;

The National (Hydro-) Meteorological Services NMHSs of Algeria, Austria, Belgium, Bulgaria, Croatia, the Czech Republic, France, Hungary, Morocco, Poland, Portugal, Romania, Slovakia, Slovenia, Tunisia and Turkey hereinafter referred to as the Members and collectively as the “ALADIN Consortium”

have agreed as follows:

ARTICLE 1 :

Purpose and Objectives

1. This Memorandum of Understanding (hereafter referred to as MoU) sets forth the goals and general objectives agreed by the Members for their collaboration (hereafter referred to as the ALADIN Collaboration), and the terms and conditions under which they will cooperate to achieve these goal and objectives.
2. The goal of the ALADIN Collaboration is to improve the value of the meteorological, hydrological and environmental warning and forecast services delivered by all Members to their users, through the operational implementation of a NWP system capable of resolving horizontal scales from the meso-beta to the meso-gamma scale and improving the prediction of severe weather phenomena such as heavy precipitation, intensive convection and strong winds.
3. This objective will be fulfilled through continuation and expansion of the activities of the ALADIN Consortium in the field of High Resolution Short Range Weather Forecast, including:
 - i. Joint research and development activities, on the basis of the ALADIN and HIRLAM Strategic Plans and related Work Plans, with the aim of maintaining the ALADIN System at scientific and technical state of the art level within the NWP community;
 - ii. Carry out the necessary scientific and technical studies to define and maintain the ALADIN System and its Canonical Model Configurations as defined in ARTICLE 2,



Paragraph 4 item v;

iii. General maintenance of the ALADIN System as defined in ARTICLE 2, Paragraph 4 item i (phasing of all code libraries);

iv. Organize coordination and networking activities in order to support the ALADIN Consortium members in their ability to run the ALADIN Canonical Model Configurations;

v. Sharing scientific results, numerical codes, operational environments, related expertise and know-how, as necessary for all ALADIN Consortium members to conduct operational and research activities with the same tools.

ARTICLE 2 :

Definitions

4. The following definitions are used in this MoU:

i. The ALADIN System is defined as the set of pre-processing, data assimilation, model and post-processing/verification software codes, tools and data shared by all Members and available to each Member and acceding Member for producing and using the best possible operational mesoscale forecasts based on a configuration compatible with its available resources.

ii. The ALADIN System is composed of shared software codes of three different types:

- the ALADIN Common Codes, defined as the codes jointly developed and maintained by the Members and the ALADIN acceding Members referred to in ARTICLE 3;
- the ALADIN Co-owned Codes defined as the codes jointly developed and maintained with other consortia or partners and co-owned by the Members and these consortia or partners (e.g. the Common ALADIN-HIRLAM Code);
- the ALADIN Shared Third-Party Codes contributed and owned by partners, other consortia or third parties who have granted appropriate rights to the Members for the use of such codes for the implementation of this MoU.

iii. A Version of the ALADIN System is any release of the ALADIN System present in the ALADIN code repository for research and development including operational purposes, or any subset of code anticipated to become part of the Common Codes.

iv. A Configuration of the ALADIN System is a subset of ALADIN Codes used by a Member or acceding Member for its own implementation.

v. A Canonical Model Configuration is a configuration of the ALADIN System for which resources are provided by the Members in order to (a) perform regular code updates, which includes the required scientific and technical validation according to the state of the art of the latest research and development, and (b) to provide the coordination and networking activities in order to install and run any canonical configuration at this state-of-the-art level by the ALADIN Consortium Members.

vi. At the time of signing this MoU, two Canonical Model Configurations exist, named AROME and ALARO, including the Météo-France and the LACE 3D-VAR assimilation configurations.



- vii. ALADIN Products are defined as outputs of the Configurations of the ALADIN System implemented by the Members or acceding Members for their operational requirements. ALADIN Products are Type A products in the ECOMET sense, i.e. “meteorological information that results from the transformation or processing of data sets in the form of pictures, charts, text or data files, is considered to require meteorological know-how to be interpreted, and has been prepared specifically to meet the operational requirements of a NMHS”.
- viii. Official Duty: all activities that take place within the organization of a NMHS, and external activities of the NMHS resulting from legal, governmental and intergovernmental requirements relating to defence, civil aviation and the safety of life and property.
- ix. National Territory: The national territory of a State, including its internal waters, its archipelagic waters, its territorial sea and its exclusive economic zone, as defined in the United Nations Convention on the Law of the Sea (UNCLOS) signed in Montego Bay on 10 December 1982 and having entered into force on 16 November 1994.
- x. International Waters: Waters not included in the internal waters, archipelagic waters, territorial sea or exclusive economic zone of any State (defined as High Seas in the UNCLOS Convention).
- xi. National Use of ALADIN Products: any sublicensing of Products or value added services by a NMHS to a nationally-based end user or to broadcaster/publisher for target recipients in the national territory of that NMHS, but not including sub-licensing to service providers.
- xii. Educational Use: Any use of ALADIN Products by a school, university, scientific institute or similar (private or institutional), solely for educational purposes, without transmission or redistribution of these products to any further third party, or use of them to generate a value added service.
- xiii. In the context of ARTICLE 9, ARTICLE 10 and ARTICLE 11, the term “ALADIN” means the Common Codes and tools jointly developed and owned by the Members, and the products generated by the various configurations of the ALADIN System.

ARTICLE 3 :

Membership

- 5. The initial Members are the signatories of this MoU at the time of its entry into force. They have all participated as full member in the activities of the ALADIN Programme under the previous ALADIN MoU and own accordingly all the common property rights and intellectual capital accumulated under the previous MoU, in proportion of their respective contributions, as recorded in ANNEX I.
- 6. This MoU is also open for signature to new Members who, alike the initial Members:
 - i. Are NMHSs of WMO members;
 - ii. Are willing to cooperate and contribute to all the objectives defined in ARTICLE 1;
 - iii. Commit to contribute at least two (2) full time equivalent persons per year to the ALADIN research and development activities under the agreed work plans;



- iv. Have firm plans to use the ALADIN system for their operational forecast procedure during the period covered by this MoU;
 - v. Accept all the terms and conditions of this MoU.
7. A NMHS wishing to join the ALADIN Consortium shall address its application to the Chairperson of the General Assembly, for consideration by the General Assembly (see ARTICLE 4).
 8. If the application of a NMHS is accepted by the General Assembly, it shall become Member after an accession period of maximum three (3) years, during which it shall:
 - i. contribute at least two (2) full time equivalent persons per year to the ALADIN research and development activities;
 - ii. contribute to the financial part of the ALADIN Annual Budget referred to in ARTICLE 7, at a level of at least 50% of the flat rate annual contribution;
 - iii. have the same rights and obligations as Members as regards the use of the ALADIN System on their National Territory;
 - iv. have no voting rights in any decision of the General Assembly concerning membership.
 9. Upon completion of this accession period, the acceding Member shall:
 - i. Have paid an entry fee of five (5) times the ceiling of the flat rate contribution to the ALADIN Annual Budget referred to in ARTICLE 7, with the understanding that the cumulated annual contributions referred to in Paragraph 8 item ii above form an integral part of that payment;
 - ii. Subject to confirmation that it actually satisfies the conditions for Membership, gain the status of Member and sign this MoU;
 - iii. As a result, have all rights and obligations of Members, including rights to use the ALADIN Products outside its National Territory, and acquire voting rights in proportion to its cumulated manpower contributions.
 10. Members and acceding Members shall abide by the terms and conditions defined in this MoU and do their utmost to implement the decisions taken by the General Assembly.
 11. Members and acceding Members shall respect regulations related to intellectual property rights and ownership and shall prevent unauthorized dissemination and use of ALADIN assets.
 12. Members shall make all reasonable efforts to use the ALADIN System or elements thereof in their daily operational forecast procedure.
 13. Members and acceding Members shall actively participate in the ALADIN Collaboration through commitment of a significant part of their NWP and modeling manpower to the work plans approved by the General Assembly and through effective participation to the ALADIN bodies, groups, meetings and workshops.
 14. A Member may withdraw from the ALADIN Consortium by giving at least one-year notice to the Chairperson of the General Assembly.
 15. Should one Member cease to fulfil the terms and conditions for membership defined in this MoU, the General Assembly may decide to terminate its membership with a one year notice from the Chairperson of the General Assembly, after exploring possible recovery actions with



that Member.

16. The rights and obligations concerning the use, ownership and maintenance of the ALADIN System under this MoU or resulting from agreements signed by the Members or one of them for the implementation of this MoU shall continue to apply to a leaving Member for a maximum period of one year after actual loss of membership. However, such rights and obligations shall be restricted to the Version of the ALADIN System available at the time, unless otherwise agreed, and shall exclude the right to use the “ALADIN” naming for the further use of this Version of the System or its Products.

ARTICLE 4 :

Governance

4.1. General Assembly

17. The General Assembly (GA) is the supreme governing body of the ALADIN Consortium. It represents its Members and acceding Members and is responsible for the implementation of this MoU, including the definition, follow-up and evaluation of all activities of the ALADIN Collaboration.
18. The General Assembly consists of Directors of each of the Members and acceding Members or their mandated representatives, who may be assisted by advisers.
19. The General Assembly:
 - i. Elects its Chairperson and Vice-chairperson;
 - ii. Decides on amendments to this MoU and on all matters concerning membership;
 - iii. Decides on the regular and substitute members of the Policy Advisory Committee (PAC) and appoints its Chairperson and Vice-chairperson;
 - iv. Approves the ALADIN Strategic Plan and other plans submitted by the PAC or by the Programme Manager (PM);
 - v. Decides on appropriate reviewing procedures;
 - vi. Identifies the common ALADIN Consortium assets and decides on detailed rules and licences, as required to implement and expand the provisions of ARTICLE 9 and ARTICLE 10;
 - vii. Decides on strategic collaboration opportunities with research institutions, NMHSs, other consortia or other third parties in the area of High Resolution Short Range Numerical Weather Prediction and authorises its Chairperson to sign relevant agreements and arrangements on behalf of the ALADIN Consortium;
 - viii. Decides to invite other organisations or other consortia to take part at its meetings as observers;



- ix. Decides on the establishment, terms of reference, membership of other subsidiary bodies or high level working groups to deal with particular issues as appropriate, and on their cancellation;
 - x. Appoints the ALADIN Programme Manager (see ARTICLE 5);
 - xi. Elects, on proposal by Programme Manager and PAC, the Chairperson of CSSI (see ARTICLE 5, Paragraph 43 item iii) among the CSSI members;
 - xii. Approves the organisation of the ALADIN Project Team, coordination and administrative support structures defined in ARTICLE 5, Paragraph 43;
 - xiii. Approves the annual work plans and associated resource commitments from all Members and acceding Members, and follows up their execution, noting the reports of operational, maintenance and manpower efforts;
 - xiv. Approves annual budgets and accounts;
 - xv. Decides on any matter or issue that cannot be resolved by the Programme Manager or the PAC.
20. The Members shall agree unanimously any amendments to this MoU.
 21. Unless otherwise specified in the Articles of this MoU, all decisions of the General Assembly shall be taken unanimously by the represented Members and acceding Members. In the absence of consensus, a decision shall be valid unless it is vetoed by more than one third of the total Members or by a group of Members having contributed to the project in a proportion higher than one third according to the records (see ANNEX I).
 22. The General Assembly shall regularly meet at least once yearly. Extraordinary General Assembly meetings could be held at the request of at least one third of the Members. The General Assembly meetings are prepared by the Programme Manager, under the responsibility of the Chairperson of the General Assembly and with the help of a so-called "Bureau" (see Article 4.4.).
 23. The General Assembly shall meet preferably at least once per year in a common meeting with the HIRLAM Council.
 24. In exceptional circumstances, a Member may represent another Member or acceding Member at a General Assembly meeting. A written authorisation shall be required for this purpose. The absent Member or acceding Member shall then be considered as represented, with delegated voting rights in the case of a Member. The delegation of voting rights does not automatically imply a delegation of signature in case of a new MoU.
 25. General Assembly meetings are valid if at least two-thirds of the Members are represented.

4.2. Chairperson and Vice-chairperson of the General Assembly

26. The Chairperson and the Vice-chairperson are elected for two years and may be re-elected, but no more than once.
27. The Chairperson of the GA chairs the meetings of the GA and represents the ALADIN Consortium with respect to third parties, during the period between two consecutive meetings.
28. The Chairperson of the GA signs collaboration agreements with third parties or commits the ALADIN Consortium, on behalf and by delegation of the GA.



29. The Chairperson of the GA may consult GA members in between meetings to seek agreement on critical issues that require quick decisions, in particular with respect to third parties.
30. In case of absence, the Vice-chairperson replaces the Chairperson.
31. The Chairperson and Vice-chairperson of the GA are not liable towards the ALADIN Consortium and towards third parties for infringements to the laws applicable to the ALADIN Consortium as well as for faults in his/her management.
32. The responsibility of the Chairperson, Vice-chairperson of the GA is collectively supported by the ALADIN Consortium, except for infringements in direct relation with its national laws.

4.3. Policy Advisory Committee

33. The Policy Advisory Committee (PAC) advises the GA in consultation with and considering proposals from the Programme Manager on strategic and policy matters arising primarily from discussions of the ALADIN strategy.
34. The PAC is composed of six (6) persons (2 from Météo-France, 2 from RC-LACE and 2 from the other components of the Programme), plus a Chairperson and a Vice-chairperson, all designated by the GA. Each pair of representatives (Météo-France, RC-LACE and other components) has a single nominative substitute, designated by the GA. The PAC members represent the full Membership, through consultation mechanisms to be agreed by the GA, and bring together strategic expertise on science, applications, management and policy.
35. Unless otherwise agreed, the PAC Chairperson and Vice-chairperson are designated among GA members, in order to facilitate efficient liaison with the GA.
36. The PAC Chairperson and Vice-chairperson are appointed by the GA for a period of two years and may be reappointed but not more than once.
37. The PAC invites observers in order to have a fair representation of the ALADIN management, the governance and the major cooperations : CSSI Chairperson, LACE Program Manager, Chairperson or Vice-Chairperson of HIRLAM Advisory Committee, at the time of signing this MoU.
38. The Terms of Reference for the PAC are specified in ANNEX III.

4.4. Bureau

39. The Bureau supports the PM and the Chairperson of the GA for preparing the necessary steps prior to the GA meetings: draft agenda, choice of relevant contributors and speakers.
40. The Bureau is composed of the GA Chairperson, the PAC Chairperson, the PM and the CSSI Chairperson. If necessary to have all three components of the Consortium represented in the Bureau (Météo-France, RC-LACE and others), the GA will designate additional members, based on proposals of its Chairperson, after consultation of the PAC.



ARTICLE 5 :

Management

41. The activities and plans approved by the GA are implemented under the responsibility of a full time Programme Manager (PM).
42. The Programme Manager, as the main executive officer of the ALADIN Consortium, reports to the GA, and is responsible for:
 - i. Making sure that the ALADIN System is maintained, with appropriate coordinated actions with its parent system (called IFS/ARPEGE), and made available to the Members and acceding Members, for implementation at their site;
 - ii. Elaboration of the Strategic Plan and of the work plans implementing this plan, under the supervision and guidance of the PAC;
 - iii. Execution of agreed work plans within the resources allocated by the GA, and reporting to the GA;
 - iv. Implementation of other decisions or actions placed on him/her by the GA;
 - v. Management and monitoring of the contributions of Members and acceding Members (manpower and financial statutory contributions to the ALADIN Annual Budget) dedicated to the implementation of this MoU, within the authority delegated by the GA, and maintaining relevant records;
 - vi. Elaboration of strategic inputs and proposals, for consideration by the PAC and GA;
 - vii. Preparation and negotiation, with the support of the PAC and other designated experts, of any draft co-operation agreement, taking into account guidelines from the GA;
 - viii. Organisation and coordination, with support from the CSSI members and the ALADIN Local Team Managers and following the guidelines of the GA or its Chairperson, of:
 - The ALADIN Project Team;
 - General Assembly meetings;
 - ALADIN Workshops (jointly organised together with the HIRLAM Consortium All Staff Meetings) and other meetings;
 - Scientific participation of the ALADIN Consortium at international NWP meetings, and actions committed to by the Consortium in the frame of international collaboration in NWP.
43. The Programme Manager is supported by :
 - i. The ALADIN Local Team Managers (LTMs): The LTMs are designated by each Member or acceding Member as being the focal points of the NMHS regarding the ALADIN Programme, under the responsibility of their NMHS respective Director. The scope of their action, in terms of rights and duties with respect to the Programme, primarily is a national one. The LTMs should receive from their NMHS the sufficient support to be able to fulfil the tasks listed in the Terms of Reference defined in ANNEX IV;
 - ii. The ALADIN Project Team involving all manpower committed by Members and acceding



Members : The Project Team encompasses all the dedicated working force for the execution of the Work Plans, the participation to the ALADIN bodies and meetings;

- iii. A Committee for Scientific and System/maintenance Issues (CSSI): The members of CSSI are proposed by the Programme Manager and the PAC Chairperson (in consultation with the PAC members), based on of their acknowledged scientific and/or technical expertise and recognition within the project. The composition of CSSI and the individual nominations are approved by the GA. The CSSI members support the action of the Programme Manager in order to ensure that the whole spectrum of planned activities can be matched. The scope of their action is collegial with respect to the major scientific topics and transversal to local applications. The Terms of Reference of the members of CSSI are described in ANNEX V;
- iv. A Code Architect (CA): The CA carries out scientific and technical studies to assist the ALADIN PM with the definition and the implementation of the ALADIN Canonical Model Configurations. The Terms of Reference of the CA are described in ANNEX VI;
- v. An ALADIN Coordinator for Networking and Applications (ACNA) who supports the PM for the preparation and the coordination of technical activity involving the ALADIN Project Team or in particular the LTMs. The aim of the ACNA is devoted to facilitate the local implementation and use of the ALADIN System by the Members. The Terms of Reference of the ACNA are described in ANNEX VII.
- vi. A Support Team for administrative, information and secretarial support.

- 44. The Programme Manager proposes the detailed organisation of the Project Team, including specific delegation of responsibilities and assignments. The Programme Manager reports about this organisation to the GA for approval as part of the work plans (see also ARTICLE 4, Paragraph 19, items xii and xiii).
- 45. System and scientific coordination within the Project Team is ensured as necessary under the authority of the Programme Manager through Thematic Working Groups led by CSSI members, e.g. in the fields of dynamics and coupling, physics, data assimilation, surface processes, predictability, verification and post-processing, code maintenance and system coordination.
- 46. The Programme Manager supervises the coordinated maintenance effort, with support of designated CSSI and Project Team Members.
- 47. The Programme Manager organises, with the support of the ALADIN/HIRLAM management staff, the joint annual ALADIN Workshop and HIRLAM All Staff Meeting where the scientific and technical priorities, the objectives and the activities that form the proposed Work Plan for the next year are defined and agreed, taking into account inputs from the Project Team and resources available from Members and acceding Members.
- 48. The Programme Manager establishes appropriate consultation and interaction mechanisms involving the LTMs and CSSI members, as necessary to enable a smooth coordination and the implementation of all activities under the agreed plans. This includes definition of priorities against available resources, anticipation or resolution of day-to-day difficulties, and reporting to the PAC remaining strategical or transversal issues.
- 49. The Programme Manager brings to the attention of the Chairperson of the GA and to the Chairperson of the PAC any issue that endangers or may endanger the execution of the agreed plans and cannot be resolved at his/her level, with the support of the LTMs and CSSI



members.

50. The Programme Manager is responsible, with support of the CSSI members and LTMs, for the coordination of the joint activities agreed by the HIRLAM and ALADIN Consortia, under terms and conditions defined in the ALADIN-HIRLAM cooperation agreement.
51. The Programme Manager shall supervise the definition and the evolution of the ALADIN System, with respect to the agreed plans and the collaboration activities (IFS/ARPEGE, HIRLAM, any further collaboration possibly undertaken by the Programme).

ARTICLE 6 :

Co-operations

52. The GA may decide to establish co-operation with entities (Institutes, Universities, other Consortia, NMHSs) outside the ALADIN Consortium, under conditions to be determined.
53. A co-operation agreement shall specify, as a minimum, the objectives and areas of co-operation and the rights and obligations of the ALADIN Consortium and of the co-operating entity, in particular in terms of their compatibility with the provisions of ARTICLE 9, ARTICLE 10 and ARTICLE 11.
54. Concerning the collaborations with ECMWF and HIRLAM :
 - because there exists, at the time of signing this MoU, an agreement between Météo-France and ECMWF concerning the use of the IFS code in the ALADIN System, the implications of this agreement are addressed in ANNEX II, and
 - because at the time of the signing of this MoU, a collaboration agreement exists between the ALADIN Consortium and the HIRLAM Consortium, the collaboration with the HIRLAM Consortium is addressed in this ALADIN-HIRLAM cooperation agreement.
 - The work plans shall be established as much as possible in common with HIRLAM.
55. A representative of a collaborating entity might be invited as an observer at the GA meetings.
56. The work plans of the ALADIN Programme might contain participation to activities promoted by EUMETNET. This participation would then be understood in the name of the ALADIN Consortium, and should be discussed within the arrangements of ARTICLE 4 and ARTICLE 5.

ARTICLE 7 :

Resources

57. The resources available for the implementation of this MoU are:
 - i. The manpower committed on an annual basis by the Members and the acceding Members for their contributions to the agreed plans covering all activities referred to in ARTICLE 1, Paragraph 3 above;



- ii. The ALADIN Annual Budget made available by the Members and acceding Members, defined as the envelope of resources required to support consortium-level overhead activities that cannot be covered by the manpower contributions of the Members and acceding Members.
58. The purpose of the ALADIN Annual Budget is to facilitate and enhance collaboration and interactions between the Members and acceding Members, with a view to increasing the collective value of their individual manpower contributions to the Collaboration, and the overall efficiency and usability of the ALADIN System.
59. The ALADIN Annual Budget should mainly cover some expenditure related to administrative or collaboration overheads and mobility that are necessary at Consortium level for efficient scientific and technical coordination and code maintenance.
60. The ALADIN Annual Budget comprises three parts:
 - i. a minimum flat rate financial contribution applicable to all Members, unless otherwise unanimously agreed by the GA in exceptional circumstances, aimed at covering the absolute minimum necessary volume of the tasks listed in Paragraph 58 above;
 - ii. additional voluntary financial contributions of Members or grouping of Members (e.g. RC-LACE);
 - iii. 'in-kind' contributions corresponding in general to consortium-level tasks other than those listed in Paragraph 58 above.
61. The minimum flat rate financial contribution applicable to all Members shall not exceed the ceiling, unless unanimously agreed by the GA. The value of the ceiling is 11000 Euro in the first year of this MoU and will be automatically adjusted every year to take into account inflation in the Euro zone.
62. The financial part of the ALADIN Annual Budget is also fed by the entry fees of new Members.
63. The way of collecting and administrating the relevant financial contributions shall be agreed by the GA, taking into account practical capacity of the Members being then in charge of the implied redistribution steps.
64. The financial contributions of Members that are also members of the RC-LACE, including their individual minimum flat rate contributions, may be contributed and administrated through RC-LACE, provided these contributions are dedicated to the execution of ALADIN purposes, outlined in Paragraphs 58 and 59. The contributions will be managed by the ALADIN PM, with the support of RC-LACE programme manager, in accordance with the provisions of ARTICLE 5, Paragraph 43, Item vi.
65. After approval, the ALADIN Annual Budget is executed under the authority and control of the PM with designated ALADIN administrative support, and, when practical, with direct administrative support from Members.
66. Resource requirements, manpower and flat rate contributions, are reviewed on an annual basis by the GA, based on proposals and reports by the PM and the LTMs. Commitments and allocation of resources are approved and recorded by the GA. Those members who wish to additionally report on voluntary and/or in-kind contributions are able to do so to the PM, who will then report to the GA.



67. The realisation of the manpower is monitored by and reported to the GA. The record of cumulative manpower contributions of Members and acceding Members is maintained by the PM and made available to Members and acceding Members. The record at the time of signature of this MoU is attached as ANNEX I.

ARTICLE 8 :

Information exchange within the Members, acceding Members and towards users

68. A joint ALADIN-HIRLAM Newsletter is published regularly.
69. An ALADIN official web-site is maintained, where all the relevant information about the project is published. A password-protected part of the web-site is available to the Members and acceding Members for restricted information exchange purposes. At the time of signing, the website address is <http://www.cnrm.meteo.fr/aladin/>.
70. The ALADIN Consortium makes its best efforts to present the ALADIN achievements at major scientific events (including its own Workshops) and publish the findings in suitable peer-reviewed journals.

ARTICLE 9 :

Ownership and property rights

71. The ALADIN Common Codes, along with all related intellectual property rights, shall be owned by the Members and acceding Members in proportion to their respective cumulative manpower contributions, as recorded by the GA, without prejudice to the intellectual property rights for those parts for which a single originator can be identified.
72. The related rights -as explained in Paragraph 71 above- will be protected by the Members under the guidance of the GA with the understanding that executive functions can be delegated as agreed to the PM.
73. Lists of ALADIN Co-owned Codes shall be included in relevant agreements with their co-owners, along with the definition of the respective rights and obligations of the co-owners.
74. Any Member contributing code or software to the ALADIN System, without being the formal owner or right-owner of that code or software shall guarantee that the rights to use such code and software for the implementation of this MoU are granted to the Members, and inform the GA in advance of any restriction affecting the possible use of that code or software by the Members.
75. The ALADIN System, or any parts thereof, cannot be sold to any third party.
76. In order to increase the scope and value of the ALADIN System, the Members may decide to share with partners or other consortia, based on reciprocal and balanced agreements:



- i. Ownership or rights attached to ALADIN Common Codes;
- ii. Ownership or rights attached to ALADIN Co-owned Codes, subject to prior agreement with the co-owners of such codes;
- iii. Rights for use of ALADIN Third-party Codes, subject to prior agreement with the owners of such codes.

ARTICLE 10 :

Conditions for access to and implementation of the ALADIN System

77. Each Member and acceding Member shall have:
 - i. full access rights to the ALADIN System source code, including rights to modify codes for the implementation of its own Configuration;
 - ii. full responsibility for and control of the Configuration(s) of the ALADIN System implemented for its research and/or operational requirements and any use authorised by this MoU, provided that such implementation is compliant with agreements signed by the Members or one of them for the execution of this MoU. In particular, compliance is required to the terms and conditions of the ECMWF/Météo-France agreement for ARPEGE/IFS software protection agreement (see ANNEX II).
78. For research purposes, a Member may grant access to the ALADIN System, or elements thereof, to another organisation in its country, or to the NMHS of a Member or Cooperating State of ECMWF which is not a Member, after prior information of the Members. Access shall then be granted under a standard R&D licence approved by the GA. This licence shall, as a minimum:
 - i. Restrict the possible use of the ALADIN System to research;
 - ii. Make applicable to the licensee relevant terms and conditions of agreements signed by the Members or one of them for the implementation of this MoU;
 - iii. Establish the irrevocable rights of the Members to access and use the results of the research in the context of the implementation of this MoU.
79. For the specific case of benchmarking or optimisation of local Configurations in collaboration with vendors, the concerned ALADIN member shall establish an agreement compliant with standard benchmark licensing, including the non-disclosure of the ALADIN System to any third Party. Benchmarking activity is considered neither as Research nor as local implementation or proof of the latter.
80. In all cases other than those addressed under Paragraphs 77, 78 and 79 above, access to the ALADIN System or elements thereof shall be subject to a specific license or collaboration agreement and decided by consensus by the GA, on a case-by-case basis.



ARTICLE 11 :

Ownership, availability and use of ALADIN Products

81. Every Member and acceding Member shall have full ownership of the ALADIN Products, produced either for official duty or for commercial purpose, using the Configuration of the ALADIN System implemented for its operational requirements, and full responsibility for their authorised use and delivery.
82. ALADIN Products produced for official duty shall be declared as “additional data” or considered as “other data” in the sense of WMO Resolution 40, with the understanding, however, that the GA may agree by consensus that some ALADIN products can be declared as “essential data”.
83. Every ALADIN Member and acceding Member will provide free and unrestricted access to ALADIN Products for educational and research purposes, within available resources and under conditions to be defined in a standard research license to be agreed by consensus by the GA.
84. The dissemination of ALADIN products and the conditions for reuse are defined by Members according to their national legislation. The ALADIN consortium recognizes the diversity of national situations with respect to data policy issues and will not interfere.
85. The ALADIN General Assembly will address any issue related to data policy, taking into account the national legislation, the national sovereignty issues, respecting the spirit of collaboration that preserves the ALADIN members interests in terms of official duties, individually or mutually.

ARTICLE 12 :

Common Assets

86. At the time of signature of this MoU the common assets of the ALADIN Consortium are the ALADIN Common Codes and Co-Owned Codes developed under previous ALADIN MoUs.

ARTICLE 13 :

Liability

87. Each ALADIN Consortium Member or acceding Member is not liable to the other Members and acceding Members for damage or injury attributable to the execution of its responsibilities under this MoU.
88. Each Member or acceding Member will bear the cost of compensation for damage or injury of any kind suffered by its personnel or property within the framework of the execution of this Memorandum except in case of gross negligence or wilful act.



89. The Members and acceding Members accept no individual or collective responsibility for damage, financially or otherwise, caused the use of the ALADIN System or any part thereof, other than those imposed by their respective national laws.

ARTICLE 14 :

Entry into force, Duration and Amendments

90. This MoU will enter into force on 1 January 2016.
91. This MoU will remain in force for 5 years . The GA may unanimously decide a prolongation or a termination of this MoU.
92. Amendments will take effect immediately after adoption by the GA. However, the GA may unanimously decide to postpone the entry into force of an amendment.

ARTICLE 15 :

Final clause

93. This MoU is the highest document of the ALADIN Consortium. It contains 15 Core Articles that are composed of 94 Paragraphs and a set of 7 Annexes at the time of the signature.
94. This MoU cannot be opposed to or supersede any national law and/or regulation to be respected by the Members¹.

¹ *With reference to the Paragraph 4 items vii and viii of the present Memorandum of Understanding (MoU), Turkey states that its position concerning United Nations Convention on the Law of the Sea (UNCLOS) remains unchanged.*



SIGNED on 10 February 2016 in Budapest by :
Representatives of the National (Hydro) Meteorological Services

On behalf of NMHS	Name	Position	Signature
Office National de la Météorologie (Algeria)	Mohamed Arab BENAMARA	Local Team Manager Aladin/Algérie	
Zentralanstalt für Meteorologie und Geodynamik (Austria)	Yong WANG	Head of Research	
Royal Meteorological Institute (Belgium)	Daniel GELLENS	Director	
Bulgarian National Institute of Meteorology and Hydrology	Andrey BOGATCHEV	Head of Department "Information Services"	
Meteorological and Hydrological Service of the Republic of Croatia	Ivan ČAČIĆ	Director	
Czech Hydrometeorological Institute	Václav DVOŘÁK	Director	
Météo-France	Olivier GUPTA	Deputy Director-General	
Hungarian Meteorological Service	Kornélia RADICS	President	
Direction de la Météorologie Nationale (Morocco)	Abdalah MOKSSIT	Director	
Institute of Meteorology and Water Management - State Research Institute (Poland)	Rafal BAKOWSKI	Deputy Director for NHMS and Meteorological Support of Civil Aviation	
Instituto Português do Mar e da Atmosfera (Portugal)	Nuno MOREIRA	Head of NWP, Weather Watch and Remote Sensing Division	
Administrația Națională de Meteorologie (Romania)	Elena MATEESCU	Executive Director	
Slovak Hydrometeorological Institute	Martin BENKO	Director	
Slovenian Environment Agency	Jure JERMAN	Head of Division for Meteorological Techniques and Modelling	
Institut National de la Météorologie de Tunisie	Abdelwaheb NMRI	Director	
Turkish State Meteorological Service	Fatih BÜYÜKKASABAŞI	Head of Forecasting Department	



ANNEX I :

Scale of manpower as of November 2015 (reflecting cumulated manpower contributions since 1 September 1991)

Country	Person x months on 30/6/15	Percentage
FRANCE	5078.75	34.6%
CZECH REP	1306.50	8.9%
BELGIUM	1161.50	7.9%
HUNGARY	1023.00	7.0%
AUSTRIA	787.50	5.4%
CROATIA	701.50	4.8%
SLOVAKIA	698.50	4.7%
ROMANIA	674.75	4.6%
MOROCCO	666.25	4.5%
SLOVENIA	596.25	4.1%
POLAND	527.50	3.6%
PORTUGAL	448.75	3.0%
BULGARIA	317.50	2.2%
ALGERIA	314.25	2.1%
TUNISIA	265.00	1.8%
TURKEY	120.25	0.8%
Total	14687.75	100%



ANNEX II :

Existence of a ‘software protection agreement’ between ECMWF and Météo-France and its implications for the ALADIN Consortium

Notice is taken that this Annex has been modified for one item with respect to the ECMWF/Météo-France agreement originally signed: Moldova has been removed from the list of ALADIN members cited in the agreement.

Since the signing of this agreement, Bulgaria and Slovakia have become Cooperating States of ECMWF.

AGREEMENT BETWEEN ECMWF & METEO-FRANCE FOR THE ACCESS AND USE OF THE JOINTLY DEVELOPED AND MAINTAINED NWP SOFTWARE IFS/ARPEGE

As amended in July 2006

Considering:

- ten years of successful joint project for the development of the IFS/ARPEGE NWP software,
- the seven years of history of the ALADIN project,
- the need to protect the software as developed by both projects against any unlicensed distribution and/or any unauthorized use and application,
- the interdependence of some ECMWF IFS applications and some ARPEGE developments,
- the advantage as IFS/ARPEGE partners to profit from the ALADIN community's contributions on outstanding NWP issues that may be beneficial both for synoptic- and meso-scales,
- the concurrence of ECMWF and Météo-France for the promotion of ECMWF medium- and long-range NWP products,
- the “Rules governing the distribution of results from the Centre’s work” approved by ECMWF Council at its 12th session (November 1988),
- Annex 1 as list of those parts of the IFS/ARPEGE software that are recognized as developed mainly in Toulouse and judged strategically important by Météo-France,
- Annex 2 as list of those parts of the IFS/ARPEGE software that are recognized as developed mainly in Reading and judged strategically important by ECMWF,
- the participation to the decisions of the Council of ECMWF by several partners of the ALADIN project which are also Members of ECMWF and in particular their possibility of stating their position in respect of possible co-operation agreements between ECMWF and third parties outside Member- or Co-operating States,

ECMWF and Météo-France have agreed the following:

Article 1

Access to the IFS/ARPEGE Software

Any ECMWF Member State or Co-operating State is granted access to the IFS/ARPEGE software without restriction.

For the access of any non-Member State or non-Cooperating State of ECMWF to parts of the IFS/ARPEGE software listed in Annex 1, the agreement of Météo-France, which will not be unreasonably withheld, is required.



The access by ALADIN partner National Meteorological Services (*), that are not from Member States or Cooperating States of ECMWF, to those parts of the IFS/ARPEGE software necessary for a potential extension from global to LAM research and operational applications, and including those listed in Annex 2, is granted without restriction provided that such parts will not be used to run routinely a global model/data assimilation system. A corresponding exchange with ECMWF in terms of scientific results via Météo-France is implied.

Access to those parts of IFS/ARPEGE listed in Annex 2, not covered by other paragraphs of this article, will be subject to the agreement of ECMWF.

Article 2

Use of the IFS/ARPEGE software

Any use by any third party of the IFS/ARPEGE software not including those parts listed in Annex 1 is only subject to the ECMWF Rules.

Any use by an ALADIN partner of the IFS/ARPEGE software not including those parts listed in Annex 2 is only subject to the Météo-France policy.

The use of the IFS/ARPEGE software by the National Meteorological Services of countries which have not yet adhered to the ALADIN project at the date of signing of this agreement are subject to the ECMWF permission, which will not be unreasonably withheld and that may depend on a decision by the ECMWF Council. A corresponding exchange with ECMWF in terms of scientific results via Météo France is implied.

Article 3

Intellectual property rights

For the avoidance of doubt it is hereby expressly declared that nothing in this agreement can be interpreted to imply the transfer of any intellectual property rights.

Article 4

Annexes

Annex 1 and Annex 2 to this agreement may be modified by mutual consent of ECMWF and Météo France from time to time as deemed necessary.

Article 5

Termination

This agreement can be terminated at any time by written agreement of both parties and shall be automatically cancelled if the ALADIN project is terminated.

Article 6

Arbitration

In the event of a dispute arising in connection with this Agreement, the Parties should attempt to settle their differences in an amicable manner. In the event that any dispute cannot be settled, it shall be finally settled under the rules of conciliation and arbitration of the International Chamber of Commerce by three Arbitrators appointed in accordance with the said rules.

For and on behalf of **ECMWF**

For and on behalf of **Météo-France**

AGREEMENT BETWEEN ECMWF & METEO-FRANCE : ANNEX 1

*Algeria, Bulgaria, Poland, Slovakia and Tunisia



ANCILLARY PARTS RELATED TO STRETCHING

- (1) Configuration 923 (generation of so-called "climatological data")
- (2) Configuration 926 (old way to change geometry from one ARPEGE configuration to another one)
- (3) Parts of Full-POS that are necessary for a change of geometry from one ARPEGE configuration to another one
- (4) Configurations for creating the matrices necessary for TRAGEO (MATDILA, MATROT, MATCONT)
- (5) TRAGEO routines (for going to and from tilted/stretched geometry)
- (6) Specific part of the horizontal diffusion corresponding to stretched geometries (on top of the common part for classical calculations)
- (7) Semi-implicit scheme option LSIDG=.T.

ALADIN RELATED PARTS

- (8) Non hydrostatic code (for its part common to ARPEGE and ALADIN)
- (9) Radiative Upper Boundary Condition code (for its part common to ARPEGE and ALADIN)
- (10) EGGS package (geometry routines for sub-domain calculations)

DATA ASSIMILATION PARTS

- (11) DFI (Digital Filter Initialisation)
- (12) CANARI (Optimum Interpolation analysis)

GENERAL MODEL PARTS

- (13) ARPEGE/ALADIN Physics Package ("Full" and "Regularised" versions)

AGREEMENT BETWEEN ECMWF & METEO-FRANCE : ANNEX 2

VARIATIONAL DATA ASSIMILATION

Definition, computation and minimization of the cost-function for 3D-Var and 4D-Var (excluding the parts needed by Canari): all specific subroutines under cval, sim4d and taskob. Background term and preconditioner, all subroutines under subjcov, cvar2in and their adjoints.

TANGENT-LINEAR AND ADJOINT CODES

The adjoint and tangent-linear versions of the observation operators and of the forecast model, regardless of the application (variational data assimilation, sensitivity studies, singular: vector computation, etc.): cnt3ad/tl, hopad/tl. The parts needed for the direct version of the codes, and the subroutines originally written by MF are excluded.

SCREENING OF OBSERVATIONS

Screening of observations developed at ECMWF, excluding the parts originally needed by Canari: all subroutines under screen.

SATELLITE OBSERVATION OPERATORS

Radiative transfer observation operators and related setup codes, i.e. hretr and below. Additional code for assimilation of rain-affected radiances The code necessary for the use of SATEM retrievals and SATOB winds is excluded, as well as software developed subject to a specific third-party agreement such as with a EUMETSAT SAF.

ENSEMBLE PREDICTION SYSTEM

The singular vector computations, i.e. cun1 and below. The forecast model parts not specific to ECMWF are excluded.



ECMWF PHYSICS PACKAGE

Everything under directory phys_ec, under subroutine suphec, and modules with name starting by yoe.

OBSERVATION HANDLING

The whole of the ODB software package



ANNEX III :

PAC's Terms of Reference

The PAC reviews and updates the ALADIN strategic objectives, taking into account user requirements and the application priorities of the Members and acceding Members.

The PAC prepares strategic plans relating the agreed strategic objectives to a scientific and development strategy.

The PAC advises with the assistance of the PM on any cooperation or other strategic issue, including new proposed activities or perspectives.

The PAC supports the PM in the negotiation of strategic collaboration agreements, based on negotiation mandates defined by the GA.

The PAC reviews the Annual ALADIN report about the work plan and the realisation of the manpower commitments of Members and acceding Members, as presented by the PM.

The PAC submits recommendations to the GA. These recommendations shall be decided by consensus of all PAC members.

The PAC reports to the GA and meets at least once a year.

The PAC meets at least once per year in a common meeting with the HIRLAM Advisory Committee.



ANNEX IV :

Local Team Managers' Terms of Reference

In general, LTMs coordinate the ALADIN activities of their respective national ALADIN project teams. Specifically:

- LTMs participate to the elaboration of Work Plans as coordinated with them and on request by the PM and CSSI. They act whenever necessary as the preferential link between the Programme and their Director on matters requiring political survey or decision-making.
- LTMs participate to the execution of the Work Plans by making proposals in terms of specific local work committed to the Programme, coordinating the latter once in the realisation phase, hosting visitors on behalf of the Programme's mobility actions and proposing local staff for remote and/or local actions. Within this task, LTMs may need to arbitrate between the Programme's and their NMHS-local priorities.
- LTMs are the contacts for some of the Programme's permanent activity, especially the common endeavour for code maintenance: LTMs propose local staff for participation to the maintenance activities and should ensure participation to these activities in a satisfactory manner (local training and competence building, participation to the phasing effort for the ALADIN system, other maintenance actions).
- LTMs remain the main contact for liaison as concerns the practical administration of the ALADIN so-called 'flat-rate budget' and, when appropriate, other budgetary issues.
- LTMs are in charge of the registration of the quarterly manpower participation of their NMHS to the Programme. They are therefore the first-level local persons able to report about the participation of their team and on the fulfilment of the statutory commitments, under the responsibility of their NMHS. More generally, LTMs keep their Directors informed about the required ALADIN work in order to get the necessary support for fulfilling the tasks concerning their NMHS.

LTMs make all necessary steps to try and ensure at their local level that a proper supervision of the work is done (not necessarily by themselves), together with a sound reporting of these activities. This implies solving all kinds of practical difficulties that may hamper the proper execution of the Work Plans. In case of strong difficulties, whatever their origin, LTMs should contact the PM for commonly finding the most appropriate ways of ironing them out.

LTMs should attend at least one of their annual meetings. They may be, on an exceptional basis, represented by a substitute, member of the same NMHS.

LTMs offer their full support for the organisation of the annual ALADIN Workshop. At minimum, they should monitor the match between the Workshop's programme and the choice of the attendees from their teams as well as the latter's proposed contributions.

LTMs encourage scientific and technical communications of the work performed at their NMHS, or by their staff remotely. Hence, LTMs should play a role of animation and encouragement towards the scientific and public recognition of the ALADIN Programme.



ANNEX V :

CSSI members' Terms of Reference

The Members of CSSI help the PM on the following issues :

- supervision of the coordinated maintenance effort;
- preparation of the ALADIN Work Plans, in the lines of the ALADIN Strategic Plan;
- preparation of progress reports;
- risk analysis: evaluation of R&D opportunities, analysis of technological changes and their implications for the ALADIN System (especially in the IFS/ARPEGE general context), anticipation of day-to-day difficulties and definition of priorities against available resources;
- coordination of the joint activities agreed by the HIRLAM and ALADIN Consortia, within their field of expertise;
- scientific and technical collaboration with external Parties;
- sharing with the PM the decision on manning the scientific and technical participation of the ALADIN Consortium at international NWP meetings;
- readiness, when needed, to report to the GA about important evolutions (including risks), results or expectations within their field of competency;
- expertise for the PM, when needed, inter alii for the preparation of PAC and Bureau Sessions.

The CSSI meets at least once per year in a common meeting with the HIRLAM Management Group.



ANNEX VI :

Terms of Reference of the Code Architect

The Code Architect shall technically assist the ALADIN PM in supervising the definition of the ALADIN System, see, ARTICLE 5, Paragraph 43

This includes the following specific tasks; the Code Architect (CA)

- will finalize the physics-dynamics action;
- will document the scientific consistency between different physics packages and the dynamics;
- propose technical solutions to implement new pieces of code in the model code, consistent with the common numerical framework (including the physics-dynamics interface and the constraints from the time step organization);
- will execute a 5-year engineering program with the aim to define the ALADIN System , according to a road map agreed with the ALADIN PM and PAC;
- will monitor the definition of the Canonical Model Configurations.

The CA will de facto be part of CSSI and will work in close collaboration with the ACNA and the chair of CSSI.

The ALADIN PM regularly reports about the activity of the CA to PAC.



ANNEX VII :

Terms of Reference of ACNA

The ALADIN Coordinator for Networking and Applications (ACNA) shall assist the ALADIN PM in the following tasks:

- Preparation of the LTM meeting and the coordination of actions to be taken by the LTMs.
- Supervise changes in the preparation of input files necessary for the Members, in order to run local versions of the ALADIN System (for example: coupling files, climatological files).
- Coordinate the tests of new versions of the ALADIN System: help on the local installation, supervise the meteorological performance, distribute the needed technical tasks among the ALADIN partners.
- Participate to the CSSI meetings
- For coordination tasks related to the above bullets, participate in the liaison with HIRLAM, especially the HIRLAM System coordination

The ACNA coordination shall not include a full operational level of requirement of the ALADIN System for any Member, since operational strategy and validation of the local NWP system shall remain under the full responsibility of each Member.



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