Preamble
This Agreement specifies the conditions for the collaboration between the ALADIN Consortium and the HIRLAM Consortium.

The ALADIN and HIRLAM Consortia will address the issues raised in the Joint Declaration of the ALADIN General Assembly and the HIRLAM Council, signed 2 December 2014 (in Appendix 1 of this Agreement) with the aim of forming one single consortium by the end of 2020. The items of this Agreement may be subject to changes while clarifying these issues. Such changes will enter into force upon a joint decision of the ALADIN General Assembly and the HIRLAM Council.

1. Parties
1.1 On the one hand the ALADIN Consortium, represented by the Chairperson of its General Assembly, and on the other hand the HIRLAM Consortium, represented by the Chairperson of its Council.

2. Prime objective
2.1 The prime objective is to provide the ALADIN and the HIRLAM Members with a state-of-the-art NWP-model for Short and Very Short Range Forecasting including Nowcasting, for both Research and Development activities and Operational usage.

3. Scope of the collaboration
3.1 The Parties have agreed to co-operate in fields related to Mesoscale modelling including the full NWP suite of observation processing, assimilation, forecasting both deterministic and probabilistic, post-processing and verification.

3.2 The collaboration aims at enabling each consortium and any of its Members or acceding Member to carry out research and development activities using a shared ALADIN - HIRLAM System, as defined in paragraph 4.1, which is jointly developed, made available and maintained.

3.3 The collaboration focuses on the development of ALADIN - HIRLAM Common Codes, centrally maintained in compliance with ECMWF IFS rules and standards, suitable for operational use. However, the decisions regarding the operational code implementation remain within each consortium (Appendix 3).

3.4 As soon as possible, the Parties will agree a general strategy for their scientific and technical collaboration during the time of this Agreement. This will guide the preparation of the annual work plans.
4. Definitions

4.1 For this Agreement the definitions shall be the following:

The shared ALADIN-HIRLAM System shall mean the complete code that is necessary for executing all configurations that are part of the agreed collaboration according to this Agreement. The ALADIN-HIRLAM System is composed of shared codes of four different types:

- the ALADIN Common Codes, defined as the codes jointly developed, maintained and owned by the Members of the ALADIN Consortium;
- the HIRLAM Common Codes, defined as the codes jointly developed, maintained and owned by the Members of the HIRLAM Consortium;
- the ALADIN-HIRLAM Common Codes defined as the codes jointly developed, maintained and owned by the Members of both consortia;
- other ALADIN-HIRLAM codes that are either co-owned or owned by third parties and shared under relevant provisions of agreements concluded by either consortium or by Member(s) thereof with such third parties extending rights to both consortia.

A Configuration of the shared ALADIN-HIRLAM System is a subset of the codes used by an ALADIN or HIRLAM Member or acceding Member for its own implementation.

A Canonical Model Configuration is a configuration of the shared ALADIN-HIRLAM System for which resources are provided by the ALADIN or HIRLAM Members in order to perform regular code updates. This includes the required scientific and technical validation according to the state of the art of the latest research and development results/practices.

Phasing shall mean the activity by which a new version of the shared codes is created. The phasing encompasses the following aspects:

- analyse the likely impacts on the shared codes of the planned and proposed contributions at the time of submitting them and make sure that other Members are aware of both those contributions and their possible impact;
- merge the scientific and technical contributions developed by the Members, in compliance with ECMWF IFS rules and standards, and to do so, adapt the contributions so as to solve all merging conflicts, trying not to break those contributions
- adapt the limited area codes and options to the evolution of the IFS/ARPEGE codes as well as adapt or repair IFS/ARPEGE relevant changes that break limited area codes and options,
- assess at technical level that a new code version provides technically acceptable results (with respect to a reference) and that numerical performances and code portability are maintained.

The Co-ordination Group shall mean the Programme Managers from ALADIN and HIRLAM, forming a common working group for the overall co-ordination of activities stipulated in accordance with this Agreement. The Co-ordination Group may appoint experts for support whenever they find it necessary.

Member shall mean any national NMHS who is a party of either the HIRLAM or ALADIN MoUs, or an acceding Member to one of the two consortia.

5. Commitments of the Parties

5.1 The Parties shall contribute to research and development activities in accordance with annual agreements (common research/work plan), according to paragraph 6.3.

5.2 The Parties shall also contribute to Code evolution coordination and to code Phasing at agreed intervals.

5.3 The Parties shall provide the Co-ordination Group all the information enabling it to report their contributions to the ALADIN General Assembly and HIRLAM Council.
6. **Collaboration**

6.1 ALADIN and HIRLAM will carry out:

- joint research and development activities, on the basis of the ALADIN and HIRLAM Strategic Plans and related Work Plans,
- the necessary scientific and technical studies to define and maintain the shared ALADIN-HIRLAM System and its Canonical Model Configurations (the definitions of the CMC will be monitored by the ALADIN and HIRLAM PMs, the HMG and the CSSI),
- general maintenance of the codes necessary to operate the shared ALADIN-HIRLAM System (phasing of all code libraries) in an ALADIN-HIRLAM common repository,
- Sharing scientific results, numerical codes, operational environments, related expertise and know-how.

6.2 The consortia will meet annually at a joint ALADIN General Assembly and HIRLAM Council meeting.

6.3 The ALADIN Assembly and the HIRLAM Council shall annually decide during the common ALADIN GA/HIRLAM Council meeting upon the common research/work plan to be carried out. The work plan shall include explicit indications of the resources that Members plan to dedicate to Phasing during the year that follows.

6.4 When the ALADIN General Assembly and the HIRLAM Council meet, they will make decisions following their own voting mechanisms, voting on decisions as separate consortia.

7. **Intellectual Property Rights and licensing rules for the shared codes**

7.1 For the collaboration under this Agreement a list of all shared codes shall be drawn up and maintained by the Co-ordination Group, identifying (i) the ALADIN - HIRLAM Common Codes, (ii) the HIRLAM Common Codes, (iii) the ALADIN Common Codes, and (iv) other shared Codes with appropriate reference to the owners and the rights granted by the owner to the Parties.

7.2 Only ALADIN - HIRLAM Common Codes shall be jointly owned by the Parties to this Agreement and the Members of both ALADIN and HIRLAM consortia have the right to use these codes for any purpose at their service. This joint ownership shall be protected by the Members of both Consortia. Following the Joint Declaration (in Appendix 1 of this Agreement), the Parties will work during the first year of this Agreement to establish an initial list of the ALADIN-HIRLAM Common Codes and present it to the ALADIN General Assembly and the HIRLAM Council for approval. This list will be then updated every year.

7.3 The right of use by any Member of any of the consortia of parts of the shared ALADIN-HIRLAM System which are not ALADIN - HIRLAM Common Codes is hereby granted by the owning Consortium

7.4 Any Party introducing code or software to the collaboration stipulated by this Agreement without being the formal owner or right-holder to that code or software shall guarantee that it has secured the right to use such code or software within the scope of this Agreement.

7.5 Any Member of ALADIN or HIRLAM consortia shall have the right to license within its country and for non-commercial research purposes the ALADIN - HIRLAM shared system. Any such grant shall be reported without undue delay to the Co-ordination Group. A written contract using a standardized template shall be drawn up securing that the use of the licensed code by the Licensee is according to Appendix 2 of this Agreement as well as developments made by the Licensee may be used by the Parties within the scope of this Agreement.

7.6 For the specific case of benchmarking or optimisation of local Configurations in collaboration with vendors, the concerned Member shall establish an agreement compliant with standard benchmark licensing, including the non-disclosure of the ALADIN-HIRLAM shared system to
any third Party. Benchmarking activity is considered neither as Research nor as local implementation or proof of the latter.

7.6 Licensing for non commercial purposes to other users is subject to prior agreement of the ALADIN General Assembly and the HIRLAM Council.

7.7 Licensing of ALADIN - HIRLAM Common Codes or shared codes owned by either consortium to third parties for any operational use shall be prohibited unless otherwise jointly decided by the ALADIN Assembly and the HIRLAM Council.

8. **Ownership, availability and Use of Products**

8.1 Products are defined as outputs of the model configuration run by any Member of either the ALADIN or HIRLAM Consortium, using the shared ALADIN-HIRLAM System, ALADIN-HIRLAM Common Codes or other codes made available by the other consortium. Products are Type A products in the ECOMET sense, currently defined as “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 an NMHS”.

8.2 Every Member and acceding Member shall have full ownership of the Products, produced either for official duty or for commercial purpose, using the Configuration of the shared System implemented for its operational requirements, and full responsibility for their authorised use and delivery.

8.3 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 ALADIN General Assembly and HIRLAM Council may agree by consensus that some products can be declared as “essential data”.

8.4 Every Member and acceding Member will provide free and unrestricted access to 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 ALADIN GA and HIRLAM Council.

8.5 The dissemination of products and the conditions for reuse are defined by Members according to their national legislation. The ALADIN and HIRLAM consortia recognize the diversity of national situations with respect to data policy issues and will not interfere.

8.6 The ALADIN General Assembly and HIRLAM Council 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 and HIRLAM members interests in terms of official duties, individually or mutually.

9. **Duration and termination**

9.1 This Agreement shall enter into force when signed by the Parties and shall be valid until superseded by a common MoU or terminated by the Parties, and for a period of maximum five years.

9.2 Either Party can terminate this Agreement by giving a written notice of two years prior to the termination date.

9.3 In the event of a notice to terminate the Parties will consult to ensure the termination on the most economical terms.

9.4 The rights and responsibilities of the Parties regarding intellectual property rights and disputes will continue irrespective of the termination of this Agreement.
10. Disputes
10.1 Any dispute concerning this Agreement, its validity, its interpretation or any circumstances in connection therewith shall be solved amicably. An arbitration panel consisting of one member from each of the Parties shall be formed which shall propose a settlement of the dispute agreeable to both Parties. Should either of the Parties not accept the settlement proposal this shall lead to termination of this Agreement.

11. Amendments
11.1 Any amendment to this Agreement shall be in writing and signed by both Parties to be valid.

12. Language
12.1 This Agreement and any circumstances in connection therewith shall be subject to the English language. Should this Agreement be translated into any other language and the translation holds contradictions relative to the English version, the wording of the English version shall prevail.

SIGNED in Darmstadt, on 8 December 2016

Mr. Martin Benko
Chairperson and representative for the ALADIN Consortium and its Members

Mrs. Marianne Thyrring
Chairperson and representative for the HIRLAM Consortium and its Members
Recognizing the capabilities and achievements of the NMHS belonging to ALADIN and HIRLAM consortia:

1. The NMHS present at the joint ALADIN-HIRLAM meeting (Dec 2, 2014) share the same objective to jointly develop and maintain the best possible skilled limited area weather forecasting system, building on the developments of the IFS/ARPEGE global forecast system and on the ALADIN and HIRLAM limited area systems. This limited area system is defined as a set of data pre-processing, data assimilation, atmospheric model and post-processing tools for producing the best possible operational Mesoscale weather forecasts.

2. ALADIN and HIRLAM consortia will work together with the aim of forming one single consortium by the end of the 2016-2020 MoUs. To this aim, the following issues have to be resolved:
   - code ownership (software IPR): current situation and suitable evolutions. In particular advantages vs drawbacks of open source solutions should be assessed;
   - data policy (access to model outputs); to this aim a map of the various current operational configurations of the limited area system should be produced and scenarios for data dissemination should be assessed;
   - global picture of annual contribution of countries to the various types of activities (from fundamental research to code implementation);
   - identification of common activities and specific activities (possibility of core and optional programs);
   - branding (including suitable evolution of the name of the system).

3. Human resources to support the work will be identified.

4. Both PM will report every six months on those issues to the consortia governing bodies.

5. A joint meeting of governing bodies of both consortia will be held at least once a year.
ALADIN – HIRLAM Agreement : Appendix 2

Conditions for use of the shared ALADIN-HIRLAM System, or parts thereof, for scientific or technical non-commercial research purposes by users not Members of either the ALADIN or HIRLAM Consortia

(1) The list of codes of the shared ALADIN-HIRLAM System to which the user is granted access shall be notified to the user as part of the licence, and communicated to the ALADIN General Assembly and the HIRLAM Council. That list shall not include codes of the shared ALADIN-HIRLAM System that are not fully owned by either consortium, unless the owner of such codes has transferred appropriate rights to license the code.

(2) The user shall not have access to the original version of the full shared ALADIN HIRLAM System available at ECMWF or other installations, or elements thereof. He/she shall make use of separate authorised copies of appropriate parts of the system kept under his or her own responsibility.

(3) Under no circumstances shall the user pass on or sell the shared ALADIN-HIRLAM System or parts thereof which he/she has access to, to any third party without the written consent of the ALADIN Assembly and the HIRLAM Council. This restriction also applies to distribution over electronic networks such as the Internet.

(4) Under no circumstances shall the user pass on or sell meteorological or climatological products based on the shared ALADIN HIRLAM System or parts thereof to any third party.

(5) All results of research carried out with the licensed software shall be made available to the ALADIN and HIRLAM Consortium Members with appropriate rights to use such results.

(6) In the publication resulting from the research carried out, the origin of the system shall be acknowledged by the following text: "The shared ALADIN HIRLAM System was made available by the ALADIN and HIRLAM Consortia involving the national meteorological services of <list of Members>".

(7) Access to the shared ALADIN - HIRLAM System or elements thereof shall be for a period of three years from the date of signing the license agreement. The Licensee shall provide annually a full report of research carried out in relation to the license agreement.

(8) The license is for the user while at specified affiliation. The license is rescinded if the user leaves that affiliation and all installed elements of the ALADIN - HIRLAM System he/she was granted access to have to be removed. Instead a new application may be made.

(9) A copy of the source code of all software developed directly as a result of the research involving the shared ALADIN HIRLAM System shall be made available to the Members of the ALADIN and HIRLAM consortia with full, irrevocable rights to use any such software for any purpose.

(10) The Members of the ALADIN and HIRLAM consortia do not guarantee the correctness of the licensed codes in any sense, nor do they accept any responsibility for their maintenance or updating.

(11) The Members of the ALADIN and HIRLAM consortia accept no responsibility for damage, financially or otherwise, caused by the use of any part of the licensed codes.
ALADIN – HIRLAM Agreement : Appendix 3

Agreement between ECMWF & METEO-FRANCE
For the access and use
of the jointly developed and maintained NWP software
IFS/ARPEGE

(as signed on 21/09/2016 by Florence Rabier on behalf of ECMWF and Jean-Marc Lacave on behalf of Météo-France, see below on pages 9/17 to 17/17)
AGREEMENT
BETWEEN ECMWF & METEO-FRANCE
FOR THE ACCESS AND USE
OF THE JOINTLY DEVELOPED AND MAINTAINED NWP SOFTWARE
IFS/ARPEGE

As amended by the Council at its 65th session (July 2006)
Entry into force of the Agreement on 19 February 1999

Considering:

- the successful joint project for the development of the IFS/ARPEGE NWP software that has been continuing since 1987,
- the history of the ALADIN project that has been continuing since 1991 and has developed successfully IFS-ARPEGE software integrated limited area versions,
- the history of the HIRLAM project that was initiated in 1985,
- the convergence process of the ALADIN and HIRLAM consortia, including the fact that both consortia share codes based on IFS/ARPEGE NWP software,
- 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 concurrence of ECMWF and Météo-France for the promotion of ECMWF medium- and long-range NWP products,
- the interest of the IFS/ARPEGE partners to benefit from the contributions of the ALADIN and HIRLAM communities on outstanding NWP issues that may be beneficial both to synoptic- and meso-scales weather forecasting,
- the "Rules governing the distribution of ECMWF ….. and Software adopted by ECMWF Council at its 51st session (December 1995) and, most recently amended by ECMWF Council at its 82nd session (July 2014),
- Annex 1 as list of those parts of the IFS/ARPEGE software that are recognized as developed mainly by Météo-France and by the ALADIN and HIRLAM partners 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 by ECMWF and judged strategically important by ECMWF,
- Annex 3 as list of those parts of the IFS/ARPEGE software in which third parties have proprietary rights,
• the participation to the decisions of the Council of ECMWF by several partners of the ALADIN and HIRLAM projects which are also Members or Co-operating States 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-Co-operating 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 HIRLAM and ALADIN partner National Meteorological Services (*), that are not from Member States or Co-operating 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 or HIRLAM 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 or HIRLAM projects at the date of signing of this agreement are subject to the ECMWF permission, which will not be

Algeria, Poland and Tunisia
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

Communications

Communications about access to, maintenance, development and use of IFS/ARPEGE software by ALADIN and HIRLAM partners shall be conducted with and through Météo-France and not directly between those partners and ECMWF.

Article 4

Third Party Code

If either party wishes to introduce code, which contains third party proprietary rights into the IFS/ARPEGE software, it will seek the agreement of the other party; identify the code in Annex 3 and ensure that there are no restrictions on the continuing access to and use of the modified IFS/ARPEGE software by the parties and the ALADIN and HIRLAM partners.

Article 5

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 6

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 7

Termination

This agreement can be terminated at any time by written agreement of both parties.
Article 8

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

Signature: 

Name: Florence Rabier

Position: Director General

Date*: 21/09/2016

For and on behalf of Météo-France

Signature: 

Name: 

Position: DG

Date*: 21/09/2016

* The original version of this agreement was signed for and on behalf of both Parties on 19 February 1999.
ANNEX 1

ANCILLARY PARTS RELATED TO THE VARIABLE-RESOLUTION GLOBAL MODEL GEOMETRY (historically referred to as STRETCHING)

(1) Preparation of model physiographic data (aka configuration ‘923’): routines listed in the directory “arpifs/e9xx”

(2) Parts of the Full-POS software that are specific to a change of geometry from one ARPEGE configuration to another one, including the TRACARE and TRARECA routines (change of grid with stretching)

(3) Conversion between two ARPEGE variable-resolution geometries in spectral space (TRAGEO software and preparation of the MATDILA, MATCONT matrices)

(4) Parts of the model dynamics and horizontal diffusion that are specific to the variable-resolution geometry (codes conditional to RSTRET>1 or NSTYP>1)

(5) Semi-implicit scheme option LSIDG=.T.

ALADIN RELATED PARTS

(6) Non hydrostatic code in “arpifs/adiab” under key LNHDYN

(7) Radiative Upper Boundary Condition code (for its part common to ARPEGE and ALADIN)

(8) EGGX package in “ifsaux/utilities/eggx.F90” (geometry routines for sub-domain calculations)

DATA ASSIMILATION PARTS

(9) DFI (Digital Filter Initialisation), routines listed in the directory “arpifs/dfi”

(10) CANARI (Optimum Interpolation analysis), routines listed in the directory “arpifs/canari”

(11) Ground-based radar observation operators and codes for monitoring and screening of radar data (reflectivity, Doppler winds): “arpifs/op_obs/refslim.F90, reflsim_2dop.F90”

GENERAL MODEL PARTS

(12) ARPEGE/ALADIN/ALARO/HIRLAM Physics Packages called below MF_PHY (in directory “arpifs/phys_dmn”)
(13) The code defining the physics/dynamics interface, routine CPTEND_FLEX

(14) ARPEGE regularised (aka simplified) physics for 4D-VAR (in "arpifs/phys_dmn")

(15) Input/output server (in directory "arpifs/io_serv") and drivers called from IFS/ARPEGE
ANNEX 2

VARIATIONAL DATA ASSIMILATION

Definition, computation and minimization of the cost-function for 4D-Var (excluding the parts needed by Canari).
Handling of background term and pre-conditioner.

TANGENT-LINEAR AND ADJOINT CODES

The adjoint and tangent-linear versions of the observation operators and of the forecast model.
The parts needed for the direct version of the codes and the subroutines originally written by MF are excluded as well as the software listed in annex 3 (?).

SCREENING OF OBSERVATIONS

Screening of observations developed at ECMWF, excluding the parts needed by Canari. All subroutines under SCREEN.

ENSEMBLE PREDICTION SYSTEM

The singular vector computations.

ECMWF PHYSICS PACKAGE

Everything under directory phys_ec.

OBSERVATIONAL DATA BASE (ODB)

Everything in the project odb

VARIATIONAL BIAS CORRECTION AND VARIATIONAL QUALITY CONTROL

All subroutines named varbc_xxxx

BLACKLIST SOFTWARE

Everything under project bl
ANNEX 3

RTTOV

Developed subject to a specific third-party agreement with EUMETSAT SAF. Distributed under the following copyright:

This software was developed within the context of
the EUMETSAT Satellite Application Facility on
Numerical Weather Prediction (NWP SAF), under the
Cooperation Agreement dated 25 November 1998, between
EUMETSAT and the Met Office, UK, by one or more partners
within the NWP SAF. The partners in the NWP SAF are
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RADIATION (RRTM AND SRTM)

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