Job description – Engineer, ANR project

Job title :

Engineer in informatic development in the field of snowpack simulation at Centre d'Etudes de la Neige (CNRM/CEN, Météo-France – CNRS, Grenoble, France)

Working conditions :
Office hours

Geographic localisation :
Grenoble.

Head:
PI of EBONI ANR project (M. Dumont)

Schedule :
The job is available on 1/1/2018 for 12 months (possible time extension)
Applications are expected by mail to matthieu.lafaysseATmeteo.fr (cc marie.dumontATmeteo.fr before 30 Nov 2017).
Applications must include a CV and a cover letter. 1 to 3 recommendation letters may encourage the application.
Applications will be examined during December 2017, including interviews of the pre-selected candidates, in order to choose the name of the selected candidate allowing the position to be taken up at the beginning of January 2018.

Salary : Salary will provided according to CNRS salary rates. Depending on the background of the retained candidate, the net monthly salary will amount from 1982 € to 2406 €.

Overview and context :

CEN is a unit of the Centre National de Recherche Météorologique (CNRM), a mixed research unit of Météo-France and CNRS. Its missions include research actions in all domains linked to snowpack study and moutain meteorology. The research topics are focused on the improvement of knowledge about the snow material and the physical processes happening at all scales, meteorological analysis and forecast in mountainous areas, snowpack remote-sensing and specific instrumentation associated with this environment. These works include the development and the transfer of tools in support of avalanche hazard forecasting (especially the SAFRAN - SURFEX/ISBA-Crocus – MEPRA modelling chain, S2M) and flood in snowmelt dominated basins, and specific methods for climatic reanalysis and projection of surface meteorological conditions and snowpack conditions in mountainous areas.

The snowpack simulation tools are based on the surface model SURFEX from CNRM which incorporates the detailed Crocus snowpack model.

The EBONI project intends to ameliorate snowpack numerical modelling, among others by accounting in the model for physical processes not yet represented and by setting up a satellite data assimilation scheme. In this context, several technical informatic developments are planned in and around the surface model.

The recruitment of an engineer in informatic development interested in snowpack related problematics aims to implement in concrete terms the developments mentioned above with the support of the CEN team.

Content of the position:

➓ Management of developments relative to snow modelling in the SURFEX code (implemented in Fortran 90) with the GIT version control system.
↘ Phasing of scientific and technical developments from CEN and of some scientific developments achieved by partners (depending on priorities and completion of these developments) ;
↘ Phasing of these developments with SURFEX main branch maintained by another CNRM team (GMME); delivery of the next CEN contribution to the GMME team (version 8.2)
↘ Development of tests to complement the tests base by all Crocus options and configurations commonly used at CEN;
↘ Support to users (installation and debugging)
↘ Update of user documentation and writing of technical documentations

➓ Recoding of a particles filter algorithm for data assimilation, initially implemented by a PhD student:
↘ Analysis of constraints and needs to define the development strategy
↘ Recoding in order to better integrate it to the existing codes, optimize numerical costs on a supercomputer, facilitate a large use and respect operational codes constraints at Météo-France (*vortex* project) ;
↘ Code management with GIT ;
↘ Development of a tests base ;
↘ Writing of user documentation and technical documentation.

➓ Harmonisation of post-processing codes of snowpack simulations :
↘ Incorporate all functionnalities of statistical scores and visualisation of snowpack simulations implemented in python by several CEN students and scientists trying to harmonise them and to mutualise a number of redundant instructions (in the context of the *snowtools_git* project) ;
↘ Convert the codes to the PEP8 norm ; prepare the migration towards python 3 ;
↘ Development of a tests base ;
↘ Writing of user documentation and technical documentation.

Skills:

This job requires interest and recognised skills in informatic programing (good knowledge of Git, Fortran90 and MPI, and python), including in the context of parallel supercomputing.
It requires an interest for team work and technical support.
Fluency in written English is expected. An interest for modelling of physical phenomena and for snow science will be appreciated. All complementary experience in team numerical development and/or in research in related fields would be beneficial.