Post-doctoral Research Fellowship at Météo France

RADARMETEOROLOGY AT S, C AND X-BAND

Application deadline: 30 September 2020

Duration/Start: 12 months renewable, starting as soon as possible ideally 1st November 2020

Salary: between 2.6 and 3.2 k€ net monthly depending on candidate experience.

Location: Météo France Weather Radar Centre. The radar center is located at the météopole, about 6 km from Toulouse town centre (about 20 minutes by bike and 30 minutes by metro).

Work description

Météo France (the French National Weather Service) is seeking a post-doctoral researcher to work 24 months on quantitative precipitation estimation at X, C and S band.

This project is the continuation of Météo France long-lasting investment on radar polarimetry which started more than a decade ago. Taking advantage of dual-polarisation capabilities at S C and X band can still be considered has challenge, but in 2019, a new fully polarimetric radar processing chain with a K_{DP}-based rain rate estimator for high rain rates, a precipitation-induced attenuation correction, and meteorological echo identification and hydrometeor classification was declared operational at Météo France. This significant operational change has largely benefited from continued work on: dual-polarisation parameters quality assessment and monitoring, artefact removal and attenuation correction improvements, radome and bright band impact analysis on quantitative estimation at X-band. Some of the most recent works are illustrated in the following papers:

Preliminary investigation of the relationship between differential phase shift and path-integrated attenuation at the X band frequency in an Alpine environment, Guy Delrieu, Anil Kumar Khanal, Nan Yu, Frédéric Cazenave, Brice Boudevillain, Nicolas Gaussiat- Atmospheric Measurement Techniques, 2020

Impact of the Altitudinal Gradients of Precipitation on the Radar QPE Bias in the French Alps, D Faure, G Delrieu, N Gaussiat - Atmosphere, 2019

Polarimetric X band weather radars for quantitative precipitation estimation in mountainous regions
N Yu, N Gaussiat, P Tabary - Quarterly Journal of the Royal Meteorological Society, 2018

The work proposed in this fellowship will consist in improving further the dualpol QPE algorithms by:

- combining Z, ZDR and KDP to bring the benefits of dual polarisation to lower rain rates.

- applying the polarimetric consistency relationship to check the calibration of the horizontal reflectivity of all polarimetric radars;
- proposing and testing dual polarisation algorithms to estimate the precipitation intensity when radar is measuring signal from frozen precipitation (hail / snow / graupel).

- adapting the Vertical Profile of Reflectivity (VPR) correction module that is used currently in the French operational QPE chain to the type of precipitation and microphysical signatures.

The selected post-doc student will join an enthusiastic team of about 15 people including several other talented post-docs working full time on radar R&D.

Required qualification

Applicants should have a Ph.D. in Meteorology or Radar Remote Sensing. Knowledge of polarimetric radars and related algorithms is considered extremely important. Applicants should be fluent in oral and written English. Knowledge of French would be an advantage. A good knowledge of UNIX / LINUX and of programming languages (C, C++) is required. Experience with PYTHON, R or similar is highly recommended. The work will be supervised by Dr. Nicolas Gaussiat (Météo France, Toulouse, France). This job is offered with no restriction on age, sex or nationality, in accordance with French law.

Applicants should send:

- a letter of interest,
- a curriculum vitae (resume + list of publications),
- date of availability,
- names, fax numbers, e-mail and post addresses of two references to:

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