Post-doctoral Research Fellowship at Météo France

POLARIMETRIC QUANTITATIVE PRECIPITATION ESTIMATION AT S, C AND X-BAND

Application deadline: 31 January 2013
Duration / Start: 24 months, starting ideally 1st April 2013
Salary: between 2.4 and 2.9 k€ net monthly pending on the experience of candidate.
Place: Centre de Météorologie Radar, Direction des Systèmes d’Observation, Météo France, 42, Avenue Coriolis, 31057 Toulouse. The Météo France center in Toulouse is located about 6 km west of the town center (about 20 minutes by bike and 30 minutes by metro). Temporary lodging at the Météo France site is possible.

Work description

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

This project is the continuation of Météo France long-lasting investment on operational radar polarimetry, which started in 2004. Since 2004 a significant amount of work has been carried out on: data quality assessment and monitoring, artefact removal, attenuation correction, bright band identification, hydrometeor classification, impact of ground-clutter and quantitative precipitation estimation. Those works are summarized in the following papers:


The extremely positive results obtained have led to the extension of dual-polarisation to other radars in the network, which now counts more than a dozen operational polarimetric radars at S, C and X band. A first version of polarimetric processing chain (including precipitation-
induced attenuation correction and non meteorological echo identification and removal) has been introduced operationally in the first semester of 2012. A second version is currently under development and will include a $K_{DP}$-based rain rate estimator for high rain rates and a hydrometeor classification module.

The work proposed here will consist in testing offline polarimetric QPE algorithms on French S, C and X-band radar data. Validation will be conducted at the hourly time step using rain gauges. More specifically, work will be done on:

- improving the estimation of $K_{DP}$ to improve rain rate estimation at high rain rates in the context of a hybrid $R = f(Z_H; K_{DP})$ estimator;
- improving the current precipitation-induced attenuation correction schemes;
- applying the polarimetric consistency relationship to check the calibration of the horizontal reflectivity of all polarimetric radars;
- assessing the rain rate estimation uncertainty and expressing that uncertainty in a quality code (to be used subsequently in radar – radar compositing rules);
- proposing solutions to precipitation rate estimation when the radar is measuring in solid precipitation (hail / snow) and adapting the Vertical Profile of Reflectivity (VPR) correction module that is used currently in the French operational QPE chain.

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 IDL, PV-WAVE, MATLAB or similar highly recommended. The work will be supervised by Dr. Pierre Tabary (Météo France, Toulouse, France). This job is offered with no restriction on age, sex nor 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:

**Dr. Pierre TABARY**  
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