

SEMINARIO DEL GIOVEDÌ  
CETEMPS

## **Polarimetric weather radar: performance monitoring and snowfall retrieval**

***Marta Tecla Falconi***  
***Sapienza, University of Rome, IT***

**26 Ottobre 2017**

**h. 11:00, Sala riunioni “Signorelli”, Edificio Coppito 1, L’Aquila**

**Abstract.** Modern weather radar community presents different open issues, two of those are presented during this lecture. Calibration is the first topic with his sensible effect on the quantitative radar retrievals of precipitation and on hydrometeors classification. Actually a standard calibration procedure to have a constant monitoring in space and time of the whole radar system does not exist. The first part of this lecture will review the most important calibration techniques presented in literature, on single component and end-to-end. A weather radar performance monitoring is proposed using a peculiar permanent single scatterer (PSS) consisting of a big metallic roof with a periodic mesh grid structure and having a hemisphere-like shape. Comparison of model results and experimental measurements are then shown. The multifrequency retrieval of the snowfall intensity  $S$  from the radar reflectivity  $Z$ , and then the  $Z$ - $S$  relations at X-, Ka- and W-band, is the second problem to tackle by correlating the multifrequency radar measurements with co-located ground observations. In the second part, the lecture will focus on radar based snowfall intensity retrieval investigated at centimeter and millimeter wavelengths using a high-quality database of collocated ground-based precipitation and multi-frequency radar observations. The high-quality dataset results available thanks to a campaign of measure pursued in the station of Hyttiala in Finland during the Biogenic Aerosols Effects on Clouds and Climate (BAECC) campaign. Four case studies comprising various snowfall regimes and snow microphysical properties have been analyzed.

**Biografy.** Marta Tecla Falconi obtained her M.Sc. degree with honors (cum laude) in Telecommunication Engineering at Sapienza University of Rome in 2014 with a thesis on radar polarimetry, partly working with the Italian Department of Civil Protection (DPC). In November 2014 she has started a PhD program in radar and remote sensing focusing on forward scatter radar techniques and meteorological radar modelling and applications. In 2014 she received the IEEE GRS South Italy award for Best Master Thesis in remote sensing and in 2016 the “Best Young Scientist Award” at ERAD conference.