

13.37 RADAR QPE FOR AN EXTREME PRECIPITATION EVENT IN SOUTHERN BRAZIL: JANUARY 2018 FLASH FLOOD - 409MM IN 48H

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An extreme, multi day rainfall event over eastern Santa Catarina State, Brazil, during 10-12 January 2018 caused a record flooding during a beach tourism season. An unusual synoptic weather pattern induced a record precipitation of 409 mm in three days, registered by the rain gauge network. During all three days, a continuous stratiform rain ranging from 1 to 8 mmh⁻¹ was predominant. At the end of 10th January and early 11th January a development of severe convective storms over Florianopolis City, Capital of the Santa Catarina State was observed. At the rain gauge network were recorded values of 31.4 mmh-1, 25.8 mmh-1 and a historical record of 31.2 mm in 10 minutes, what generate severe damages due to flash flooding. For the analysis of rainfall spatial distribution we used Quantitative Precipitation Estimate (QPE) fields obtained by Z-R relationships from a new Dual Polarization S-Band Weather Radar located at Lontras City, about 70 km distance from Florianopolis. It was compared six Z-R relationships: traditional Marshall-Palmer (a=200, b=1.6), Joss (a=500;b=1.5), two other Z-R relationships based in studies developed in Brazil, Calheiros (a=236;b=1.5) and Santos (a=52;b=2.7), and two polarimetric Z-R relationships including reflectivity (Z), differential reflectivity (Z_{DR}) and specific differential phase (K_{DP}). A discussion about the efficiency of the QPE for the historically observed rainfall events was lead in a sense of predicted flash foods in urban areas. The tradicional Marshall-Palmer Z-R relationship show good results for the stratiform pattern of all events, but overestimated all convective cells. Using *DP* and *Z_{DR}* variables, it was possible to detect the rainfall peaks, but not exactly as observed in rain gauges. However, these polarimetric relationships could be useful for hydrometeorological purposes with a good skill. The persistent northeastern maritime influx of moisture in the area lead to a stratiform pattern during the three days. The precipitation peaks were generated by strong convection triggered during a zonal propagation of a mid-level shortwave trough over the coast. Therefore, these two distinct atmospheric regimes with a mix of maritime and continental hydrometeors content led thinking about the use of two type of the Z-R relationship according the precipitation regimen, which will be presented in this conference.
