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Rainfall detection by wireless microwave links in Italy: the story so far

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This contribution overviews the state-of-the-art of the research dedicated to rainfall monitoring through wireless microwave links in Italy. Early studies on the application of tomography to retrieve 2D rainfall fields from a mesh of terrestrial microwave links date back to the nineties. A pioneering experimental work was carried out in 2001 in the framework of the MANTISSA project. More recently, the pervasive growth of cellular mobile networks as well as the usage of Ku- and Ka-band telecommunication satellites have boosted this research area. Currently, several projects are active in Italy: some of them exploit signals transmitted across terrestrial networks (RAINBO and MOPRAM), whereas some others make use of satellite links (NEFOCAST and Living LAB). In particular, data collected from Commercial Microwave Links (CML) are key assets of RainBO and MOPRAM. The former is aimed at developing and improving methodologies and tools to mitigate the impact of extreme rainfall events over the Emilia-Romagna region (Bologna and Parma provinces mainly), by implementing, among others, a new monitoring infrastructure based on CMLs. The MOPRAM project (MOnitoring of PRecipitation through A network of Microwave radio links) aims at developing an innovative and efficient tomographic technique to track the spatial variability of rainfall fields for hydrological applications. The 2D rainfall maps retrieved from CML data are used to feed hydrological models and estimate the flow of river basins in two pilot areas in Lombardy.

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