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## On the use of cross-polarized SAR and GPS-sonde measurements for wind speed retrieval in tropical cyclones

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The current investigation is concerned with the study of the dependence of the scattered cross-polarized microwave signal from the Sentinel-1 satellite on the parameters of the marine atmospheric boundary layer based on data obtained from falling NOAA GPS-sondes under tropical cyclone conditions.

Field measurements and remote sensing data for hurricanes in the Atlantic and Pacific oceans were analyzed for the period 2016 - 2018. Based on the analysis of data measured by GPS-sondes, averaged wind speed profiles were obtained, while the parameters of the atmospheric boundary layer (drag coefficient and wind friction velocity) were retrieved using the self-similarity property of velocity profiles from measurements in the "wake" part.

Sentinel-1 SAR images were used as remote sensing data. Images with cross polarization have a high level of thermal noise (NESZ), which leads to errors when retrieving the NRCS. In this regard, preliminary image processing was performed in the SNAP application.

Using the obtained parameters of the atmospheric boundary layer, the data of GPS-sonde measurements and Sentinel-1 SAR images on cross polarization were collocated and the dependences of the NRCS on the parameters of the atmospheric boundary layer were obtained.

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