# Detecting precipitation events in Antarctica by passive microwave remote sensing.

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The mass balance of the Antarctic ice sheet is a key parameter of sea level change. In the last IPCC report, the various models predict an increase of precipitations ranging between 0 and 50% in Antarctica for the end of the century. However, assessing model reliability is limited by the fact that we don't know how to measure snowfall in Antarctica.

After snowfall, the surface emissivity increases. This should be traceable in satellite brightness temperature series ($Tb=\varepsilon.T_{surface}$). However, this needs to sort out temperature, melt, metamorphism, reworking by wind and other processes that also affect brightness temperature and microwave emissivity. We are working to develop and validate a method to detect snowfall, by comparing satellite microwave data with ERA meteorological analyzes / forecasts. Instruments are also deployed on the field to tentatively identify and separate precipitation and blowing snow events.

It is expected that the statistics of Antarctic precipitation events can be determined, at least in the coastal regions where precipitation is larger and where it is expected to increase most in the future. Climate models disagree on such simple statistics as the number of precipitation events per year. We thus expect that precipitation event statistics can help decipher which models are most relaible in their predictions.