

**A proposal of mission combining active and passive microwave sensors and its applications for global water cycle**  
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A mission carrying active and passive microwave sensors is proposed to monitor the global water cycle and air-sea coupling. The passive microwave sensor will be a successor of AMSR2 on GCOM-W2, which was launched by JAXA on 12 May 2012. Channels to observe solid precipitation will also be added to AMSR2. The active sensor will be a scatterometer at operated at Ku- and Ka-bands. The Ka-band scatterometer can measure vector wind fields near the coasts with higher spatial resolution than the Ku-band scatterometer, which is similar to SeaWinds on QuikSCAT and ADEOS-II and OSCAT on Oceansat-2. Merits of the combination of the active and passive microwave sensors will be discussed in aspects of sensor and science synergisms. The microwave radiometer contributes to improve accuracy of vector wind measurements by the scatterometer under rain conditions. The wind direction provided by the scatterometer improves accuracy of the SST, water vapor and precipitation measured by the radiometer. The science synergy includes applications for studies of monsoon, tropical cyclones, air-sea coupling in various scales, global and regional water cycles, sea ice, soil moisture and snow over land.

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