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On the self-calibrated absolute vector data produced by the ASM absolute magnetometers on board the Swarm satellites, results and prospect

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Satellites of the ESA Swarm mission carry Absolute Scalar Magnetometers (ASM) that provide the nominal 1 Hz scalar data of the mission and allow the calibration of the nominal fluxgate vector magnetometry payload. ASM instruments, however, also provide independent 1 Hz experimental self-calibrated ASM-V vector data. More than six years of such data have been produced since the launch of the mission in November 2013. They allow the construction of global geomagnetic field models fully capable of capturing the fast temporal evolution of the core field, illustrating the ability of the ASM instruments to operate as a stand-alone instrument for advanced geomagnetic investigations. In this presentation we will provide the latest update on the ASM-V data (soon to be released as a new Swarm product), report on our ongoing efforts to further use these data to improve the nominal data of the mission, and discuss the prospect offered by the planned use of a miniaturized version of this ASM on board the satellites of the NanoMagSat constellation. This nano-satellite project is currently undergoing a 6 months consolidation study funded by the ESA Scout mission program. With a launch planned in 2024, it aims at forming the basis of a low-cost constellation for permanent long-term monitoring of the geomagnetic field and ionospheric environment from space.

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