

Development of Space Magnetometers in Austria [†]

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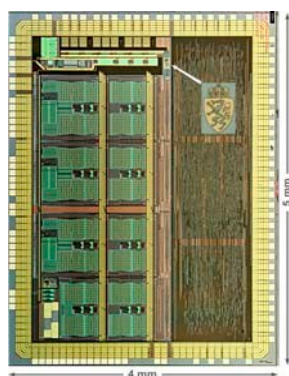
[†] Presented at the Eurosensors 2018 Conference, Graz, Austria, 9–12 September 2018.

Published: 12 December 2018

With spaceborne magnetic field measurements it is possible to investigate the interior of planets, moons and asteroids which have either an intrinsic or a crustal magnetic field. Furthermore, precise knowledge of the magnetic field is essential to derive fundamental information about the environment surrounding different bodies in the solar system as well as to explore the interplanetary space.

The first magnetometer developed in Graz was launched aboard the Russian (former USSR) VENERA-13 satellite to Venus in 1981. Others investigated Mars, asteroids and comets. The main targets of current and future missions will be the Earth, Mercury, Mars and Jupiter. The major international partners for the development of magnetometers, which must be well suited for the hostile space environment, are the Technical University of Braunschweig, the Imperial College London and the University of California, Los Angeles.

During the last years, the focus has been on the miniaturization of the near sensor electronics [1,2] (Figure 1a) and the development of a new quantum interference based magnetometer, which was launched into low Earth's orbit aboard the Chinese CSES mission in February 2018 [3] (Figure 1b).



(a)



(b)

Figure 1. (a) Space qualified Applications Specific Integrated Circuit for the readout of the fluxgate magnetic field sensors onboard NASA's Magnetospheric Multiscale Mission; (b) Flight model of the Coupled Dark State Magnetometer which was launched to its maiden flight on a Chinese rocket in February 2018.

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