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# Supposed sensitivity of accelerometers in low Earth orbit to VLF

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## Abstract

It is known since CHAMP that accelerometers show high frequency disturbances, which could be related to switching processes of electric circuits, like heaters and torquers. Analysing the accelerometers the most harmful frequencies are well below the read-out frequency of the capacity, for ONERA accelerometers 100kHz. Looking at the dispersion relation of a magnetized plasma, like the ionosphere, frequencies below about 20kHz propagate in the so called whistler mode where also some resonances are located. Especially the lower hybrid frequency is characterized by a very low speed of light and very small wavelength and can be excited and absorbed in the ionosphere by very short antennas. We propose that the receiving antenna is the accelerometer head itself and that the received signal is further broadened by the transfer function of the accelerometer electronic. We will motivate this scenario by comparing the conditions in spacecrafts with ground experiments. Shielding of these signals will be discussed.

Very low frequencies (VLF) occur also naturally in the ionosphere. We will show similarities between the whistler phenomenon and a signature on accelerometers called twangs.

Even these signals on the accelerometer do not disturb the MICROCOPE mission some naturally occurring VLF may affect the drag-free mode at distinct regions on Earth.

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