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GPS and the search for Axions

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GPS, an excellent tool for geodesy, may serve also particle physics. In the presence of Earth's magnetic field, a GPS photon may be transformed into an axion. The proposed experimental setup involves the transmission of a GPS signal from a satellite to another satellite, both in low orbit around the Earth. To increase the accuracy of the experiment, we evaluate the influence of Earth's gravitational field on the whole quantum phenomenon. There is a significant advantage in our proposal. While the geomagnetic field B is small, the magnetized length L is very large, resulting into a scale (BL)2 orders of magnitude higher than existing or proposed reaches. The transformation of the GPS photons into axion particles, will result in a dimming of the photons and even to a "light shining through the Earth"phenomenon.

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