IDENTIFICATION OF LINEAR SLOW SAUSAGE WAVES IN MAGNETIC PORES

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The analysis of an 11-hour series of high resolution white light observations of a large pore in the sunspot group NOAA 7519, observed on 5 June 1993 at the Swedish Vacuum Solar Telescope, La Palma, Canary Islands, has been recently described by Dorotovič et al. (2002). Special attention was paid to the evolution of a filamentary region attached to the pore, to horizontal motions around the pore, and to small-scale morphological changes. One of the results was the determination of temporal area evolution of the studied pore where the area itself showed a linear trend of decrease with time at an average rate of $-0.23\,\mathrm{Mm^2\,h^{-1}}$ during the entire observing period. There is strong evidence that coupling between the solar interior and magnetic atmosphere can occur at various scales and that the referred decrease of the area may be connected with a decrease of the magnetic field strength according to the magnetic field-to-size relation. Periods of global acoustic, e.g. p-mode, driven waves are usually in the range of $5-10$ minutes. However, by assuming that magneto-acoustic gravity waves may be the drivers, the observed periodicities (frequenceis) are expected to be much longer (smaller), falling well into the mMHz domain. In this work we determine typical periods in the area evolution of the pore using wavelet analysis. The resulted periods are in the range of $20-70$ minutes. Our findings suggest that periodic elements of the temporal evolution of the area of this studied pore could be considered as an observational evidence of linear low-frequency slow sausage (acoustic) waves in magnetic pores. This would give us further evidence on the coupling of global solar oscillations to the overlaying magnetic atmosphere.

References

[1] Dorotovič I., Sobotka M., Brandt P. N., Simon, G. W., 2002, A&A 387, 665