

# COMBINED OBSERVATION AND SIMULATION OF P-MODE PROPAGATION INTO THE SOLAR CORONA

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Observations have shown the connection between oscillations within the sunspot photosphere and photospheric p-modes. In the strong, vertical, magnetic field regions of sunspot umbrae, it is thought that these acoustic p-modes undergo mode conversion to slow-magnetoacoustic waves, and that these slow-magnetoacoustic p-modes may be waveguided from the photosphere into the solar corona along the magnetic field. Observations are presented of the propagation of these waves and their channelling into the coronal parts of magnetic loops, originally emerging from a sunspot region. These observations are combined with 2-D MHD numerical simulations of wave leakage and direct propagation within the model sunspot atmosphere. The simulations are driven at the photospheric level by the Doppler velocity field of p-modes observed within the sunspot, and the response of forward modelling of the atmosphere is compared to observations. In the future, this combined approach of observation and theoretical modelling may be exploited to allow magneto-seismology of the solar atmosphere above sunspots or active regions.