Identification of magnetosonic modes in Galactic turbulence

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We have detected the first observational evidence of magnetosonic modes in the Cygnus X region, with our novel method, the signature from polarization analysis (SPA). The region dominated by the magnetosonic modes overlap to a high degree with the enhanced gamma ray emission, completely in line with the predictions from the cosmic ray transport theory. Through comparison with the spectrum at other wavelengths, our results provide a new perspective in understanding star formation processes, which is intimately linked to turbulence properties as widely acknowledged. The method I am going to present, SPA, sheds light on the hitherto unknown plasma modes composition of the Galactic turbulence, and marks the onset of a new era in the study of interstellar turbulence and accordingly our understanding of cosmic ray transport and star formation.