**Oppositely directed poloidal Alfvén waves generated by a proton cloud**

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In this study, we present the first direct observation of resonant excitation of two oppositely directed poloidal Alfven waves by a proton cloud. On 15 February 2014, the Van Allen Probe A detected oscillations with a frequency of 6.8 mHz (Pc4 range) in the dayside magnetosphere. The event was recorded during the recovery phase of the substorm. Simultaneously, modulations in proton fluxes were observed. Detailed analysis revealed two cases of drift-bounce resonance between protons and ULF waves. These waves were identified as the second harmonic of poloidal Alfvén waves at the same frequency, one propagating eastward () and interacted with keV protons and the other propagating westward () and interacted with keV protons. The waves were generated by the gradient instability. The eastward wave was generated due to the upward slope of proton distribution function,and the westward one was due to the downward slope of proton distribution function.

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