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Ponderomotive forces and pc1 waves

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The paper presents a brief synopsis of the ponderomotive forces caused by PC1/Alfvén waves in the magnetosphere. We discuss the challenging questions encountered in applying the concept of ponderomotive forces to space plasma phenomena in general, and to the acceleration of plasmas in particular. Four major ponderomotive forces may be identified; related with wave gradients in space and time and combined with specific properties of the ambient media (magnetic field gradients and collisions). ULF/PC1 waves are generated in magnetopause boundaries and in localized magnetospheric dynamo regions of the Terrestrial magnetosphere. Waves propagating along magnetic field lines and reaching the Earth's ionosphere, may lead to the acceleration and escape of ionospheric plasma. ULF waves and ponderomotive forces are expected to be ubiquitous in space plasmas. Ponderomotive forcing by waves may for instance apply also to astrophysical phenomena such as the acceleration and outflow of plasma from stars and galaxies.