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Heating of the solar corona by alfvenons

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Solar photospheric convection drives myriads of dissipative Alfvén solitons (hereinafter called alfvenons) capable of accelerating electrons and ions to energies of hundreds of keV and producing the X-ray corona. Alfvenons are exact solutions of two-fluid equations for a collisionless plasma and represent natural accelerators for conversion of the electromagnetic energy flux into kinetic energy of particles in space and astrophysical plasmas. Their properties have been experimentally verified in the magnetosphere, where they accelerate auroral electrons to tens of keV.