The Role of the Chromosphere in the Energization of the Corona

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We present results on the effect of the partially ionized chromosphere on the transfer of magnetic field and energy into the corona during the birth and evolution of solar active regions. Using numerical MHD simulations which include the effects of partial ionization, namely ion-neutral collisions and Pedersen dissipation, we investigate how the magnetic flux and energy emerges from beneath the surface to energize the corona, and how these chromospheric partial ionization effects modulate these processes. Of particular interest is the nature of the electric currents and the force-free nature of the magnetic field.

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