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“Evolution of Protoplanetary Discs with Magnetically Driven Disc
Winds”

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The evolution of protoplanetary discs (PPDs), which are the birth place of planets, is still poorly understood; one of the unknowns is the dispersal mechanism of PPDs. It is generally considered that the gas component of a PPD is dispersed by the combination of viscous accretion to the central star and photoevaporation. We proposed that vertical outflows driven by the magneto turbulence in PPDs are a viable mechanism that disperses the gas component of the PPDs. Because the mass flux of the disc winds is inversely proportional to the local Keplerian time, the gas component of a PPD is cleared in an inside-out manner. As a result, the radial profile of the surface density is positive, which is opposite to the radial profile expected from standard accretion models. Such a positive slope strongly affects planet formation because it inhibits the inward drift or even causes the outward drift of pebble- to boulder-sized solid bodies, and it also slows down or even reverses the inward migration of protoplanets.