

Abstract Submitted
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Variability in the winds from magnetized massive stars: effect of unstable magnetosonic modes¹ Koushik Sen, Indian Institute of Technology Kharagpur, RODRIGO FERNANDEZ, University of Alberta — The evolution of massive stars is closely related to processes that generate heavy elements in the Universe such as supernova explosions and neutron star mergers. A key component in this evolution is the stellar wind, which displays variability on various spatial and temporal scales. The source of this large-scale variability and wind clumping in the winds of massive stars has not been established yet. At the same time, an increasing number of massive stars is found to have surface magnetic fields up to kG strength. Here we explore the incidence of a radiation-magnetohydrodynamic (MHD) instability that affects compressible MHD waves in the outer layers of massive stars with radiative envelopes. Using a stellar evolution code, we show that the instability should be present in most stars having radiative envelopes, with estimated saturation amplitudes that make this process a plausible source of the sub-photospheric variability required to account for observations.

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Koushik Sen
Indian Institute of Technology Kharagpur

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