of = 9 pc, which is significantly smaller than the radius (14pc) of W44 in radio continuum. Most of the X-ray emission in W44 originates from the interior of the H I shell. Neither the standard Sedov model nor an evaporative model can explain the two shell structure with a centrally-peaked X-ray emission of W44. We propose that the H I shell is a pre-existing shell that has been reaccelerated by the supernova blastwave. The blastwave apparently has overtaken the wind-blown shell and is propagating into the ambient interstellar medium. We discuss the dynamical evolution of W44

Nonlinear Evolution of the Parker Instability

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We examined the effect of the mode interaction to the nonlinear of the Parker instability in the background nonuniform gravitational fields. The initial equilibrium state taken is the same as that of the model Ao(Matsumoto et al. 1988) except for the geometrical size, and the type of perturbation. The random perturbation is taken in order to incorporate the spectra of the unstable mode. In particular, we emphasized the specific mode characterized by the horizontal length by enforcing the periodic boundary condition in horizontal direction.

As the instability grows, the structure of the model whose horizontal length Xmax is equal to the wavelength of the most unstable fundamental mode (max = 6.16), converges to the configuration as shown by Matsumoto et al.. For X max > max, the most unstable, fundamental mode is still dominant. But slant spurs grow as they interact with neighboring ones. We find material in galactic plane is more condensed by the strong shockwave, despite their column ratio is not so different from the case of X max= max.

Gravitational Instabilities in a Protoplanetary Disk Including the Effects of Magnetic Fields

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We investigate the gravitational instability of a thin, Keplerian protoplanetary disk including the effects of a largely azimuthal magnetic fields. The disk is assumed to consist of neutral and ionized gas and neutral dust which are coupled by gravity and friction. The growth rate and eigenfunctions are calculated numerically using non-axisymmetric linear perturbation methods. The results show that the growth rate has a maximum at some intermediate azimuthal number m, but for each value of m it is reduced relative to the