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Numerical simulations of pulsar wind-sn shell interaction

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The problem [1,2] of interaction between a pulsar wind and a relatively cold portion (He) of expanding SN shell is being solved.

In 1D, the problem is being solved both with 1D code SNDP [3] and 2D code EGAK [4]. For self-similar conditions the results are compared to approximate analytical solution [1].

SNDP has been also used to calculate turbulent mixing described by the k-ε model. The results of the 1D SNDP computations are compared to 1D and 2D numerical computations [2].

The turbulent mixing has been calculated in the 2D EGAK computations. It appears from evolution of initial random perturbations in two dimensions. A problem is solved, whose setup is closer to Crab conditions than that of ref. [2], that is the pulsar wind, shell and star wind interaction is calculated in the integrated manner. The results averaged using the method of [2] are compared to the relevant data from the 1D computations.

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