

Relativistic Spherical Shocks in Expanding Media

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We investigate the propagation of spherically symmetric shocks in relativistic homologously expanding media with density distributions following a power-law profile in their Lorentz factor. We find that the shock behavior can be characterized by their proper velocity. While generally, we do not expect the shock evolution to be self-similar, we find a critical value for which a self-similar solution with constant exists. We then use numerical simulations to investigate the behavior of general shocks. We find the region for monotonously growing shocks and the decreasing shocks which eventually die out. Finally, we present an analytic approximation, based on our numerical results, for the evolution of general shocks in the regime where it is ultra-relativistic.



Everyone is invited to attend