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Rayleigh – Taylor instabilities and radiative cooling SERGE BOUQUET, CEA-LUTH — The morphology and filamentary structure of old supernova remnants (SNR) – see for instance Crab Nebula – is still an open question. Rayleigh – Taylor instabilities (RTI) are suspected to play an important role in that structuration, however, as old SNR are optically thin, radiation can freely escape and local overdensifications can be produced. In this paper, we study the properties of media experiencing both RTI and radiative cooling. This work is performed analytically and numerically. In the analytical approach, the equations of the model are linearized and the key equation leading to the dispersion relation is derived. The structure of this key equation is studied and analytical solutions are provided in some special cases. The non linear phase of the radiative Rayleigh – Taylor instability (RRTI) is examined numerically. It is shown that compared to the pure RTI, RRTI alters the structure of heavy material spikes. The morphology of the mixing zone is also modified and the formation of overdense regions is evidenced.

Serge Bouquet
CEA-LUTH

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