Poster 1 Anuchina et al.

Numerical simulation of Rayleigh-Taylor instability in a spherically stagnating system using the MAH codes

N.N. Anuchina, V.I. Volkov, O.S. Ilyutina & O.M. Kozyrev

Russian Federal Nuclear Center – Zababakhin Institute of Technical Physics,
Snezhinsk, Russia
o.s.ilyutina@vniitf.ru
http://www.vniitf.ru

The Rayleigh-Taylor instability play a prominent role in various areas of fundamental and applied physics, specially inertial confinement fusion (ICF). If the fuel-pusher mixing is induced by the Rayleigh-Taylor instability of the contact surface, the total nuclear reaction yield will be reduced.

In the paper (Hattori *et al.*(1986)), authors investigated the linear stage of the Rayleigh-Taylor instability by modeling the stagnation dynamics with a self-similar solution.

In the present paper the results of the 2D and 3D numerical modeling of the linear and non-linear stages of the Rayleigh-Taylor instability are presented. Statement of numerical experiments was proposed in (Hattori *et al.*(1986)). The modeling was performed by using the MAH (Anuchina *et al.* (1992)) and MAH-3 (Anuchina *et al.* (2000)) program packages. At the linear stage numerical results are in good agreement with the analitical solution. For the perturbations with identical maximal value of penetration of easy gas in a heavy one the curves of bubble growth (2D, 3D), and a curve of jet growth (3D) coincide.

References

1. Hattori, F., Takabe, H. & Mima, K. 1986 Rayleigh-Taylor Instability in a Spherically Stagnating System; The Physics of Fluids, Volume 29, Number 5.
2. Anuchina, N.N., Volkov, V.I. & Es'kov, N.S. 1992 Numerical Modeling of Multi-Dimensional Flows with large deformations. Report at Russian; U.S. Weapons Laboratories introductory technical exchange in computational and computer science. Livermore.
3. Anuchina, N.N., Volkov, V.I., Gordeychuk, V.A., Es'kov, N.S, Ilyutina, O. S. & Kozyrev, O.M. 2000 3D Numerical simulation of Rayleigh-Taylor instability using MAH-3 code; Laser and Particle Beams, 18, 175-181.