LBNL-54743 Abs
HIFAN 1307a

Evaporation, Venting, and Condensation for the HIF Robust Point Design

Christophe S. Debonnel[1, 2], Simon S. Yu[2], and Per F. Peterson[1]

(1) Department of Nuclear Engineering
University of California
4118 Etcheverry Hall
Berkeley, CA 94720-1730
U.S.A.

(2) Lawrence Berkeley National Laboratory
Heavy-Ion Fusion Virtual National Laboratory
Berkeley, CA 94720
U.S.A.

The heavy-ion IFE Robust Point Design[1] (RPD-2002) is based on the HYLIFE-II thick-liquid target chamber, retaining its main characteristics and advantages while including some major improvements to control and restore the gas density in the target chamber and the beam tubes. As part of the on-going assessment of the RPD-2002, the gas dynamics code TSUNAMI has been recently thoroughly revisited. Major modifications relevant to the present analysis include a new equation of state and a rigorous treatment of the gas-liquid interface. This version of TSUNAMI has been employed at predicting the mass flux at the magnetic shutters location, the impulse loading to the thick-liquid surfaces and the time for the background gas to return to its equilibrium state after the highly transient venting that follows the target explosion.

[1] S.S. Yu, W.R. Meier, R.P Abbott, J.J. Barnard, T. Brown, D.A. Callahan, C.S. Debonnel, P. Heitzenroeder, J.F. Latkowski, B.G. Logan, S.J. Pemberton, P.F. Peterson, D.V. Rose, G.-L. Sabbi, W.M Sharp, D.R. Welch, "An updated point design for heavy ion fusion", 15th ANS topical meeting on the technology of fusion energy, Washington, D.C., November 17--21, 2002; submitted for publication in *Fusion Science and Technology*, November 2002

Corresponding author: Christophe S. Debonnel
Phone: (510) 642-0421
Fax: (510) 643-9685
Email: debonnel@nuc.berkeley.edu