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P2 Asymmetry of Au's M-band Flux and its smoothing effect due to high-Z ablator dopants YONGSHENG LI, CHUANLEI ZHAI, GUOLI REN, JIANFA GU, WENYI HUO, XUJUN MENG, WENHUA YE, KE LAN, Institute of Applied Physics and Computational Mathematics, WEIYAN ZHANG, China Academy of Engineering Physics — X-ray drive asymmetry is one of the main seeds of low-mode implosion asymmetry that blocks further improvement of the nuclear performance of "high-foot" experiments on the National Ignition Facility [Miller et al., Nucl. Fusion 44, S228(2004)]. More particularly, the P2 asymmetry of Au's M-band flux can also severely influence the implosion performance [Li et al., Phys. Plasmas 23,072705(2016)]. Here we study the smoothing effect of mid- and/or high-Z dopants in ablator on M-band flux asymmetries, by modeling and comparing the implosion processes of a Ge-doped and a Si-doped ignition capsule driven by x-ray sources with asymmetric M-band flux. As the results, (1) mid- or high-Z dopants absorb M-band flux and re-emit isotropically, helping to smooth M-band flux arriving at the ablation front, therefore reducing the P2 asymmetries of the imploding shell and hot spot; (2) the smoothing effect of Ge-dopant is more remarkable than Si-dopant due to its higher opacity than the latter in Au's M-band; and (3) placing the doped layer at a larger radius in ablator is more efficient. Applying this effect may not be a main measure to reduce the low-mode implosion asymmetry, but might be of significance in some critical situations such as Inertial Confinement Fusion (ICF) experiments very near the performance cliffs of asymmetric x-ray drives.

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