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Anti-Stokes scattering and Stokes scattering of stimulated Brillouin scattering cascade in high-intensity laser-plasmas interaction[1]
QINGSONG FENG, CHUNYANG ZHENG, ZHANJUN LIU, Peking University, CHENGZHUO XIAO, Hunan University, QING WANG, LIHUA CAO, XIANTU HE, Peking University — The anti-Stokes scattering and Stokes scattering in stimulated Brillouin scattering (SBS) cascade have been researched by the Vlasov-Maxwell simulation. In the high-intensity laser-plasmas interaction, the stimulated anti-Stokes Brillouin scattering (SABS) will occur after the second stage SBS rescattering. The mechanism of SABS has been put forward to explain this phenomenon. In the early time of SBS evolution, only the first stage SBS appears, and the total SBS reflectivity comes from the first stage SBS. However, when the high-stage SBS and SABS occur, the SBS reflectivity will appear a burst behavior, and the total reflectivity comes from the SBS cascade and SABS superimposition. The SABS will compete with the SBS rescattering to determine the total SBS reflectivity. Thus, the SBS rescattering including the SABS is an important saturation mechanism of SBS, and should be taken into account in the high-intensity laser-plasmas interaction.

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