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**Numerical Study on Wave-induced Beam Ion Prompt Losses in DIII-D Tokamak** GUOYONG FU, ZHICHEN FENG, JIA ZHU, Zhejiang University, WILLIAM HEIDBRINK, UCI, MICHAEL VAN ZEELAND, General Atomics — A numerical study is performed on the coherent beam ion prompt losses driven by Alfvén eigenmodes (AE) in DIII-D plasmas using realistic parameters and beam ion deposition profile. The synthetic signal of fast-ion loss detector (FILD) is calculated for a single AE mode. The first harmonic of the calculated FILD signal is linearly proportional to the AE amplitude with the same AE frequency in agreement with the experimental measurement. The calculated second harmonic is proportional to the square of the first harmonic for typical AE amplitudes. The coefficient of the quadratic scaling is found to be sensitive to the AE mode width. The second part of this work considers the AE drive due to coherent prompt loss. It is shown that the loss-induced mode drive is much smaller than the previous estimate and can be ignored for mode stability.

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