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Ion heating by the alpha-channeling mode in mirror machines¹ ANDREY ZHMOGINOV, NATHANIEL FISCH, Princeton University — In some mirror reactor designs, it might be advantageous to redirect a part of the extracted energy to the fuel ions in the central cell and the device plug rather than heat plasma electrons. Previously identified modes suitable for alpha-channeling in simple mirror machines were shown to damp most of their energy on electrons. Two techniques based on the minority ion species injection and mode coupling capable of redirecting a part of the wave energy to the ion heating are demonstrated and their efficiency is estimated. Also, a method of calculating the alpha-channeling mode structure is proposed to evaluate the feasibility of energy redirection in practical mirror devices.

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