Mode Coupling and Minority Ion Injection for Alpha-Channeling in Mirror Machines*

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The linear magnetic trap is an attractive concept for fusion research and plasma applications due to its high-beta operation and relative engineering simplicity. The alpha-channeling technique can benefit this concept by providing means for fusion ash extraction and redirecting alpha particle energy to fuel ion heating [1]. There is the potential to significantly increase the effective fusion reactivity. Previously, modes suitable for alpha-channeling in mirror machines were identified [2,3]. Here, we show how using mode coupling and minority ion injection, damping on electrons can be minimized in favor of damping on fuel ions.

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