

Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Theoretical investigation of GAMs in stellarators¹ W. SENGUPTA, A.B. HASSAM, University of Maryland, College Park — The possibility of observing GAMs in quasisymmetric (QS) stellarators such as HSX is investigated. GAMs in axisymmetric tokamaks can be excited because, theoretically, the parameter $|\vec{B} \cdot \nabla \vec{B}|/|\vec{B} \times \nabla B|$, which is a measure of the bounce frequency compared to the GAM frequency ($\omega_{bounce} \approx c_s/qR \ll \omega_{GAM} \approx c_s/R$), is small. In QS stellarators, however, this ratio may not be small enough, leading to Landau damping. We study a QS system, using a model which spans a broad range in this parameter, and apply the results to HSX in the QS mode. HSX can also operate in a Mirror Mode. Due to the intrinsic non-ambipolarity of the Mirror mode, a zonal flow oscillation with frequency lower than that of the standard GAM may be excited, as shown by Helander et al.[1] Trapped particles contribute significantly to this oscillation. We study this case and assess whether GAMs could be observed on HSX in the mirror mode.

[1] Helander P et al. 2011 Plasma Physics and Controlled Fusion **53** 054006

¹Work supported by DOE.

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Date submitted: 19 Jul 2012

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