

The Effect of ELMs on HHFW Heating of NBI Generated H-modes*

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ELMs reduce the stored energy achieved with HHFW heating compared with the ELM free case as occurs for NBI heating alone. This reduction can be attributed both to direct ELM ejection of stored energy and to an increase in edge density with ELMs that exceeds the onset density for perpendicular wave propagation near the antenna [1,2], and leads to significantly more edge RF power deposition. This latter effect causes a more intense RF “hot” zone in the lower divertor scrape off region and an increase in heat flux to the “hot” zone. Fast IR measurements of the direct ELM heat deposition at the lower divertor shows it to be peaked in the vicinity of the outer strike radius and to fall off strongly as the “hot” zone is approached, indicating little direct effect on the “hot” zone heating. Physics studies of the “hot” zone have begun with sweeping the “hot” zone spiral over Rogowski instrumented divertor region tiles to show that the tile currents track the location of the zone. The relation of the results here to the AORSA RF code simulations including the SOL region is pointed out.

[1] C.K. Phillips *et al*, *Nuclear Fusion* **49**, (2009) 075015.

[2] J.C. Hosea *et al.*, *AIP Conf Proceedings* **1187** (2009) 105.

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