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Lower hybrid and ICRF driven scrape-off-layer density modifications and their impact on lower hybrid power coupling on Alcator C-Mod[1] Y. LIN, C. LAU, G. WALLACE, S.J. WUKITCH, B. LABOMBARD, R. OCHOUKOV, S. SHIRAIWA, J. TERRY, MIT, PSFC, G. HANSON, J. WILGEN, ORNL, ALCATOR C-MOD TEAM — Scrape-off-layer (SOL) density profiles have been measured by a reflectometer at three poloidal locations adjacent to the lower hybrid (LH) launcher. Large modifications on SOL density profiles and strong poloidal density striations have been observed with the application of LH power. Such modifications in SOL have been shown to degrade LH power coupling. Adding ICRF power also modifies the SOL density and further degrades LH coupling, particularly when the ICRF antenna and LH launcher are magnetically connected. With density striations, calculating the LH reflection coefficient assuming a poloidally uniform density profile can have large mismatches vs. the experimental measurement. The density modifications with LH power can be reproduced by a 2-D diffusive-convective model that includes the dynamics of the LH induced ExB convective eddies. Adding ICRF power, the model shows that the overall density profile appears to be a superposition of both LH and ICRF driven convection. Based on our study, a gas puff system that aims at improving LH coupling will need to account for the poloidal variations in SOL density.

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Y. Lin
MIT, PSFC

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