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**Enhanced non-coronal carbon radiation facilitating detachment in DIII-D X-divertor: a SOLPS-ITER study** ZHONGPING CHEN, MIKE KOTSCHENREUTHER, SWADESH MAHAJAN, University of Texas — The X-divertor(XD) in DIII-D has demonstrated, through simulation, abilities to boost carbon radiation and hence to achieve similar detached conditions (target temperature  $\sim 2\text{eV}$  within the first heat flux scrape-off-layer width) with less than half the upstream density of the standard divertor(SD). Simulations suggest that the XD geometry vastly expanded the carbon line radiation volume near the target through multiple mechanisms that enhance the non-coronal effect which strongly increases the carbon emissivity in 10-30 eV range. We will provide a few physics pictures supported by simulation data to demonstrate the critical role of the ultra shallow field angle in the XD in relevance to carbon radiation.

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