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**Using mixed gases for massive gas injection disruption mitigation on Alcator C-Mod** M. BAKHTIARI, UW-Madison, R. GRANETZ, V. IZZO, MIT-PSFC, D.G. WHYTE, UW-Madison, M. REINKE, K. ZHUROVICH, MIT-PSFC — Massive gas injection of noble gases has shown promising results on several tokamaks for mitigating the potential damage cause by disruptions. JT-60U experiments using conventional gas puffing for mitigation previously showed promising results from mixing the gases. We report the use of mixed noble gases with massive gas injection on Alcator C-Mod in order to optimize radiation efficiency, halo current reductions and the overall response time of the mitigation system. Gas-mixtures of helium with incremental fractions of argon (0-50%) were used. Experiments show that injecting the He/Ar mixtures lead to faster thermal and current quenches as compared to a pure helium or argon injection, thus improving the time response and halo current reduction. Small amounts of argon also lead to optimized radiation fractions with large electron density increases in the core plasma. These results are partially explained by the expectation that small fractions of argon will be entrained with the faster helium at the early phase of the flow. The gas mixing allows one to simultaneously exploit the faster particle delivery rate of the helium with the large radiation capability of the argon.

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