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**Development of Temperature-Controlled Irradiation Station  
for Heavy-Ion Irradiations in ATLAS**

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**ABSTRACT**

The heavy-ion irradiation of up to  $\sim 1.5$  MeV/nucleon energy available in ATLAS accelerator is appropriate for replicating in-pile fuel changes from  $\sim 100$  MeV fission fragments. As radiation-induced microstructural modifications vary significantly with irradiation temperature, temperature-control capability must be established to ensure that ion irradiation experiments produce valuable results. Therefore, efforts have been made to develop sample holders with precise temperature control. In particular, it is crucial to keep U-Mo dispersion fuel at a range of  $\sim 100$ - $150^\circ\text{C}$  (operating temperature in research reactors) under high ion beam current to replicate high-burnup conditions. In addition to existing high temperature samples holder ( $>300^\circ\text{C}$ ), a new water-cooled low-temperature (R.T. to  $300^\circ\text{C}$ ) sample holder is currently under development, with a prototype completed and tested. The temperature-control capability will advance the studies on radiation-induced microstructural modifications in U-Mo dispersion fuels supported by ATLAS irradiation.