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FRIB target thermal image processing for accurate temperature maps

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The FRIB target receives the primary beam at high power and produces fragments. The carbon disc target is rotating at 500 RPM, and is water cooled, but if one of these heat management strategies fails, local temperatures on the target can increase to the point of material damage. A thermal imaging camera was temperature calibrated and installed for the purpose of monitoring the target temperature map in real time. Various image processing strategies were deployed to improve the accuracy and usefulness of the resulting image. Processing stages include intensity to temperature conversion, median filter to remove dead pixels, and flat field correction to compensate for vignetting and edge effects.

Footnotes

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