A customizable wide field-of-view multiband imager for lunar atmospheric Studies

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Ground based observations have indicated that at times the lunar Sodium atmosphere extends beyond the Earth. However, to date no experiment has been conducted to perform an extended duration, in-situ observation of the lunar atmosphere. We have designed a small (10 × 10 × 10 cm³ and a mass of 1.3 Kg), multi-band imager that operates in the CCD-band (approximately, 450 – 900 nm). The instrument is easily tailored to meet a specific application by selecting the appropriate combination of interference filters. If such an instrument is placed on a lunar orbiting platform, it will generate a long-term database to study the morphology of the lunar atmosphere or surface features observable in this band.

The instrument has an angular resolution of 0.1° and a field of view of 35° × 25°. This large field of view is shared by a mosaic of interference filters chosen for a specific application. The instrument uses a custom-designed computer program for automatic exposure control and communicates using standard serial and ethernet protocols.

This design has been validated using commercial off-the-shelf components for sodium and potassium resonance emissions at 589 nm and 770 nm, respectively.