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## **Flight hardware verification and validation of the K-line fire sensor payload on ZACube-2**

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### **Abstract**

With the launch of the ZACube-2 nanosatellite, a new technique of wildfire detection and monitoring from space will be evaluated. Potassium is an essential plant macronutrient and all vegetation biomass fires exhibit characteristic spectral ‘K-line’ emissions in the near infrared (NIR), which can be isolated and observed with suitable optical filtering. However, as a new technique, the effectiveness of this kind of sensor from a space platform is unknown. The magnitude of the K-line emission signal seen from space is contingent on many factors, including the concentration of potassium in the biomass fuel, fire size and intensity as well as atmospheric state. The architecture and preparation of the flight model K-line sensor hardware is described, together with the approach to verification and validation of the sensor characteristics and performance on-orbit.