

## **A novel technique for the continuous evaluation of a burning rate of solid rocket propellant by using IR thermography**

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### **Abstract**

In this study, a novel technique for evaluating continuously burning rate of cylindrical cores made of a solid homogeneous propellant is presented. The propellant core was placed in the tube made of pyrolytic graphite (pyrographite). The burning rate of the rocket propellant has been determined by monitoring the burning front/zone movement on the external surface of the pyrographite tube by using an IR camera. A double-base propellant was applied in this particular validation experiment. The continuous thermal analysis of the burning front/zone has been possible due to the fact that pyrographite is characterized by a uniquely high anisotropy of thermal conductivity along its crystallographic perpendicular directions. The technique was verified by numerical modelling. The numerical results confirmed the proposed procedure performance when used for such investigations.

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