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Design of a Compact Herriott Cell for Heat Flux Measurement Applications

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Abstract : In this paper we present the design of an optical device based on a Herriott multi-pass cell fabricated on a small sized acrylic slab for heat flux measurements using the deflection of a laser beam propagating inside the cell. The beam deflection is produced by the heat flux conducted to the acrylic slab due to a gradient in the refractive index. The use of a long path cell as the sensitive element in this measurement device, gives the possibility of high sensitivity within a small size device. We present the optical design as well as some experimental results in order to validate the device's operation principle.

Keywords : heat flux, Herriott cell, optical beam deflection, thermal conductivity
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