

**VANADIUM DIOXIDE BASED FABRY-PEROT EMITTER FOR DYNAMIC
RADIATIVE COOLING APPLICATIONS**

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ABSTRACT. An asymmetric Fabry-Perot emitter is proposed with a lossless dielectric spacer sandwiched between a vanadium dioxide (VO_2) thin film and an opaque aluminum substrate. Switchable mid-infrared emittance has been achieved due to the insulator-to-metal transition of VO_2 . When VO_2 is dielectric below 341 K, the structure is highly reflective, whereas a Fabry-Perot resonance cavity is formed with high broadband emissivity at 10 μm when VO_2 becomes metallic above 345 K. The radiative properties are calculated via a uniaxial transfer matrix method and Bruggeman effective medium theory. This study will facilitate novel applications in building and spacecraft radiative cooling.