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Optomechanically induced transparency in membrane-in-the-middle setup at room temperature

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We demonstrate the analogue of electromagnetically induced transparency in a room temperature cavity optomechanics setup formed by a thin semitransparent membrane within a Fabry-Pérot cavity. Due to destructive interference, a weak probe field is completely reflected by the cavity when the pump beam is resonant with the motional red sideband of the cavity. Under this condition we infer a significant slowing down of light of hundreds of microseconds, which is easily tuned by shifting the membrane along the cavity axis. We also observe the associated phenomenon of electromagnetically induced amplification which occurs due to constructive interference when the pump is resonant with the blue sideband.