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**Four-Wave Mixing in Hot Sodium Vapor Cells with Saturated Absorption** HIO GIAP OOI, QIMIN ZHANG, SAESUN KIM, ALBERTO MARINO, ARNE SCHWETTMANN, University of Oklahoma — Four-wave mixing (4WM) is a non-linear process that can produce correlated twin beams of light, which are useful for quantum-enhanced sensing and interferometry below the shot-noise limit. We generate two beams of light, known as probe and conjugate, via a double-lambda scheme in a hot sodium atomic vapor cell. Twin beams have been previously generated in Rubidium. However, sodium has a smaller hyperfine splitting, which causes the Doppler-broadened absorption lines to overlap and thus a significant absorption of the conjugate. To reduce the resulting loss of conjugate photons, we investigate a saturated absorption method. An additional on-resonance beam from our dye laser excites atoms on one of the transitions. Tuning the dye laser allows us to minimize the absorption of conjugate photons that are near to one of the atomic transitions. We present our experimental progress and characterize the dependency of the gain on the saturating beam angle and frequency.

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