

## **Cs microcell stabilized laser based on dual-frequency sub-Doppler spectroscopy**

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We present an in-progress study about the development of Cs microcell stabilized lasers based on dual-frequency sub-Doppler spectroscopy (DFSDS). Two laser systems were mounted, each of them being locked onto the Cs atom  $D_1$  line at 895 nm, and a beatnote between these two systems is counted. First tests, comparing a DFB laser system and an ECDL laser system, yielded an Allan deviation of about  $10^{-12}$  at 1 s, limited by the intermodulation effect from the DFB laser system. An optical reference at 895 nm was then developed from a cavity-stability laser at 1.5  $\mu$  using optical frequency combs. First comparisons between this optical reference and the microcell-based ECDL give an Allan deviation of  $3 \cdot 10^{-13}$  at 1 s. These results are very encouraging and demonstrate the potential of the DFSDS approach for the development of ultra-stable microcell optical frequency references.