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**Progress of a Cold-Atom CPT Clock based on the Grating Magneto-Optical Trap** RACHEL ELVIN, GREGORY W. HOTH, MICHAEL W. WRIGHT, BEN LEWIS, AIDAN S. ARNOLD, PAUL F. GRIFFIN, ERLING RIIS, University of Strathclyde — We present an experiment that aims to be developed into a portable cold-atom microwave clock. The apparatus is based on a grating magneto-optical trap (GMOT) and the coherent population trapping (CPT) technique, enabling future operation outside of the laboratory environment. The GMOT provides a relatively simple source of cold atomic vapour with good optical access. From one cooling beam incident on a 20 x 20 mm chip made up of three micro-fabricated linear gratings, we can trap and cool $\sim 10^7$ $^{87}$Rb atoms to $< 30$ $\mu$K when operating the experiment as a clock. We realise our clock signal by adopting CPT in a high-contrast scheme referred to as Lin$\perp$Lin, and by measuring the transmission of the laser probe through the cold atom cloud. A pulsed Raman-Ramsey sequence is implemented to allow for long free evolution times and narrow Ramsey-CPT fringes, whilst also mitigating light-shifts picked up from the interrogation. Here, we will discuss on our efforts in optimising the signal-noise ratio of the Ramsey fringes, characterisation of the detection system as well as some of the systematic shifts we have observed. We report on a signal-noise ratio of approximately 50 and a short-term frequency stability with an Allan deviation of $3 \times 10^{-11}/\sqrt{\tau}$.

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