

Abstract Submitted
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Frequency reference for Nanosatellite Quantum technology mission SAPAM RANJITA CHANU, Centre for Quantum Technologies, National University of Singapore, Block S15, 3 Science Drive 2, 117543, AARON STRANGFELD, MARKUS KRUTZIK, Humboldt-Universität zu Berlin, Institute of Physics, Newtonstrae 15, 12489 Berlin, ALEXANDER LING, Centre for Quantum Technologies, National University of Singapore, Block S15, 3 Science Drive 2, 117543 — We report on our latest progress on the ongoing development of a compact optical frequency reference for CubeSat missions in LEO. The reference will be based on Doppler free laser spectroscopy of rubidium vapor. Our simplified solution is based on frequency modulation spectroscopy using a customized, shielded 5 mm long vapor cell and a monolithic distributed feedback (DFB) laser diode on a mesoscopic breadboard setup. The electro-optical system features miniaturized optics as well as a polarization maintaining fiber coupling inside a housing with dimensions of 70 mm \times 25 mm \times 25 mm. The latter will be installed on a 100 mm \times 100 mm \times 100 mm electronics board for full functionality of the system. This way, our reference constitutes a key technology for future compact, simple and robust atomic quantum technologies for nanosatellite applications, e.g. inertial sensors or clocks.

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