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Optomechanical and thermal design of a wide bandwidth, high precision Rubidium locked Etalon calibrator

Reliable, high precision wavelength calibration is a bottleneck for commissioning a number of the next generation of Doppler spectrographs. We have developed a method to reference a wide bandwidth Etalon to a Rubidium transition to enable long-term stability and precision in the range below 10 cm/s. A key part of the whole instrument is the Etalon assembly itself. We strive to reach maximum passive stability, which requires careful consideration of the Etalon optical materials and coatings, the mechanical design of the holder and the enclosure, and the thermal control with layers of active thermal shells. In addition, the Rubidium spectroscopy unit, which ultimately provides the reference point for the whole spectrum, needs to be designed for optimal mechanical stability and isolation from environmental changes. Here we discuss details of the optomechanical design and lab tests of these subassemblies, on our way to final integration of an observatory-ready instrument.

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