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【472】High precision laser frequency offset stabilization using a hybrid frequency discriminator

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Applications of lasers in quantum metrology require precise control of the laser frequency. This is usually achieved by locking the frequency of a slave laser at a tunable offset from a master laser. Here we present a new scheme for a robust and high precision laser offset frequency locking. A hybrid frequency discriminator generates an error signal that has a wide capture range of more than 150 MHz while preserving sharp resonance needed for a tight lock. The Allan deviation was measured to be less than 55 Hz at 30 seconds and remained below 1 kHz for more than 1000 seconds.

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