

Abstract Submitted  
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**Laser frequency stabilization by light shift of optical-magnetic double resonances**<sup>1</sup> YUANZHI ZHAN, XIANG PENG, ZAISHENG LIN, WEI GONG, HONG GUO, Peking University, Beijing, China — This work adopts the light shift of optical-magnetic double resonance frequency in metastable-state  $^4\text{He}$  atoms to lock the laser center frequency to the magic point. At this magic frequency, both the left-circularly and right-circularly optical pumping processes will give the same value of optical-magnetic double resonance. With this method and after locking, experimental results show that the laser frequency fluctuation is dramatically reduced to 2.79 MHz in 3600 seconds, comparing with 34.1 MHz drift in the free running mode. In application, with the locked magic laser frequency, the heading error for laser pumped  $^4\text{He}$  magnetometer can be eliminated much.

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