

Atomic magnetometer achieves visual salience analysis in *Drosophila*

Authors:

Fan Liu [†], Dongmei Li [†], Yixiao Li, Zhao Xiang, Yuhai Chen, Zhenyuan Xu, Qiang Lin, Yi Ruan ^{*}

Zhejiang Provincial Key Laboratory and Collaborative Innovation Center for Quantum Precision Measurement, College of Science, Zhejiang University of Technology, Hangzhou 310023, China

* Correspondence: yiruan@zjut.edu.cn

[†] These authors contributed equally to this work.

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Supplementary information Text

Figs. S1 to S4

Spin exchange relaxation free atomic magnetometer (SERF AM):

A single-light spin exchange relaxation free atomic magnetometer(SERF AM) achieved $20 \text{ fT} / \sqrt{\text{Hz}}$ before measuring, and the noise power spectral density described the sensitivity as shown in FIG.S1.

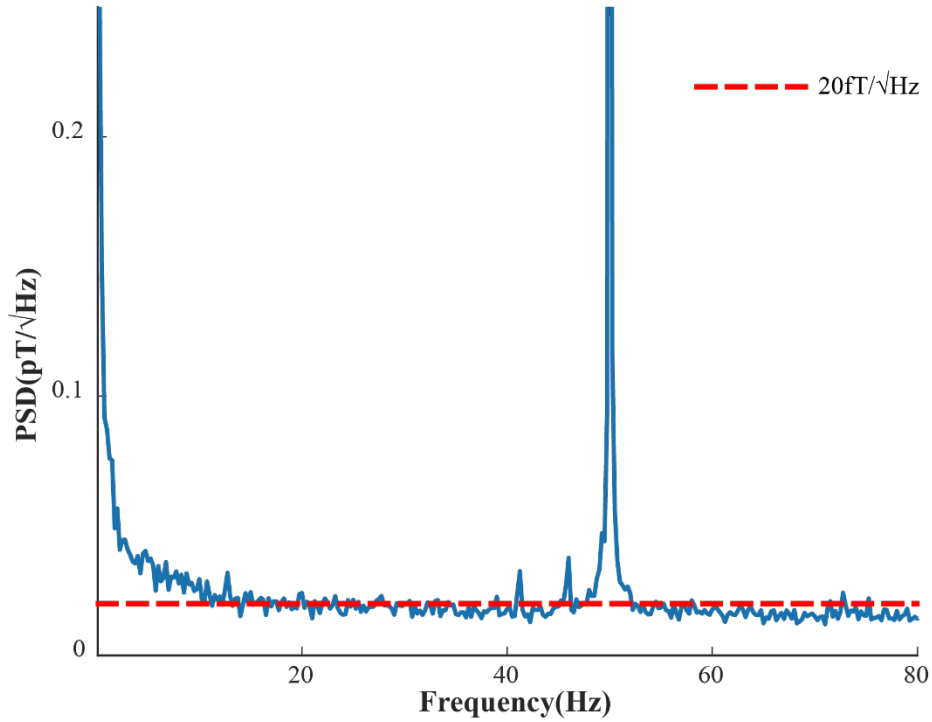


Figure S1: Sensitivity of SERF atomic magnetometer

Figure S2 shows that the PSD in the frequency range between 1 and 30 Hz was significantly increased under dead *Drosophila* condition compared with unloading in our measurements. It should be noted that such a raise of PSD under dead *drosophila* condition may be caused by the unconscious muscle movement of the body after the brain of the fruit fly dies.

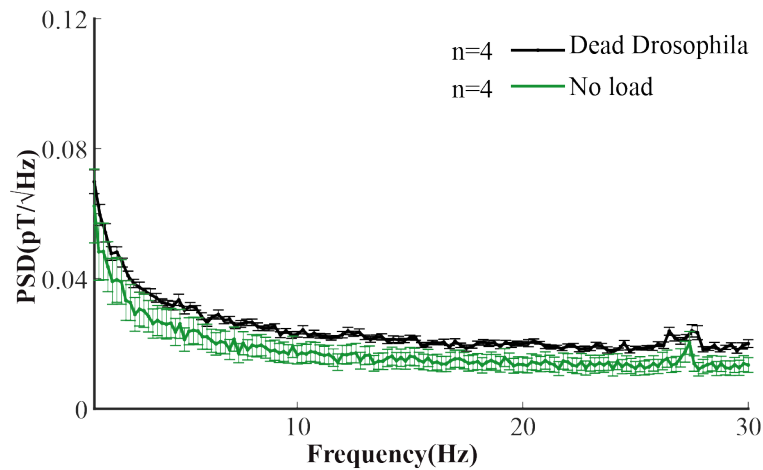


Figure S2: Power Spectral Density (PSD) between 1 - 30 Hz, dead flies (black line) and unloading (green line).

As indicated in Fig S3 and Fig S4, that 1 - 20 Hz and 30 - 80 response in the presence of stimulation have almost no change compared with that without stimulation $p > 0.05$, $n = 11$ flies.

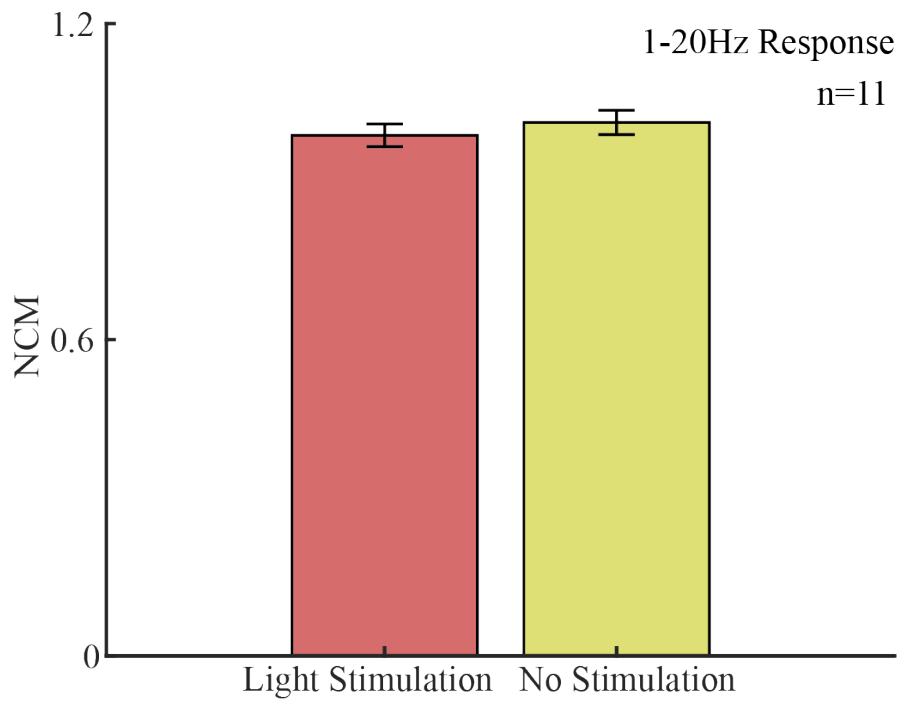


Figure S3: Average 1-20 Hz NCM (\pm SEM) : No Stimulation (yellow) , Light Stimulation (red).

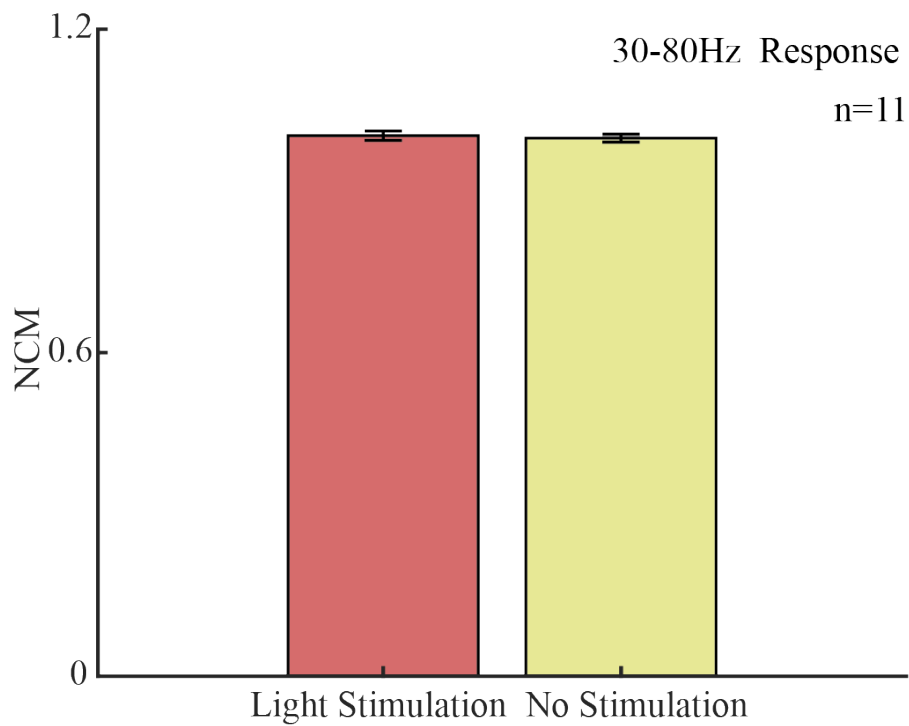


Figure S4: Average 30-80 Hz NCM (\pm SEM): No Stimulation (yellow),
Light Stimulation (red).