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## **Measurement and simulations of the energy variation-induced orbit motion in a low momentum compaction APS lattice**

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The APS Upgrade storage ring will keep the same rf system that is currently used at APS. This rf system has amplitude and phase noise dominated by the lines at 60, 180, and 360 Hz. APS presently operates with a synchrotron frequency close to 2 kHz, which is far away from the rf noise frequencies, but APS-U will operate with a bunch-lengthening cavity, which could lower the synchrotron frequency down to the range between 100 to 500 Hz depending on the cavity setup. Such low synchrotron frequency could lead to resonant amplification of the energy variation-induced orbit motion. In this paper, we describe measurements of the orbit motion at APS in a specifically designed low momentum compaction lattice that allowed us to lower synchrotron frequency below 300 Hz. We also show good agreement with our simulations.

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### **Footnotes**

### **I have read and accept the Privacy Policy Statement**

Yes

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