# **INITIAL WORK ON THE DESIGN OF A LONGITUDINAL BUNCH-BY-BUNCH FEEDBACK KICKER AT DIAMOND**

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In 2017 it is planned to install some additional normal conducting cavities into the Diamond accelerator. There is some concern that the higher order modes in these devices will cause longitudinal instabilities in the beam. In order to deal with this potential problem we have started work on a designing longitudinal feedback system. We have a simulation of the kicker cavity, which is of the overloaded cavity type based on the LNLS design. Initial work to modify it to be suitable for installation into the Diamond racetrack vacuum chamber, and to move the central resonance to **1.64GHz** have been done. Further work to couple out the unwanted third harmonic of the cavity is required.

Changing the pipe shape to investigate installation into the Diamond vacuum chamber



Both pipe modifications introduce unwanted sharp resonances

# Changing cavity radius to increase the main cavity resonance

cavity radius 84.7mm cavity radius 70mm



The third cavity harmonic is still trapped in

### **Contribution of cavity**



## **Contribution of tapers**

# the structure. Further modifications will be needed in order to deal with this.



