MATTER AND TECHNOLOGIES

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HOM Damping of 3rd Harmonic Copper Cavities for Active Operation in the BESSY II Storage Ring

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BESSY II third generation light source is a 1.7 GeV storage ring. It delivers high intensity 15ps pulses in standard user optics and shorter pulses in low alpha optics with reduced intensity. The integrated 3rd harmonic copper cavities (so called Landau cavities) are operated in passive mode and enable lifetime improvement of the storage ring. Currently a new type of 3rd harmonic cavity is under development for active operation in the storage ring for precise phase-amplitude control of the cavity voltage. The stable operation of those cavities in the storage ring requires strong HOM damping to avoid coupled bunch instabilities. This requires careful analyses of the HOM dampers and HOM power levels for the BESSY II fill pattern at 300mA current. Hence, as part of the cavity design, the appropriate absorbers are designed to extract the HOM power from the system. The analyses of HOM power levels and the integration of ferrite absorbers will be presented.

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