

# Workshop on Radiation Effects in Superconducting Magnet Materials 2015 (RESMM'15)

Contribution ID : 11

## MARS15 Energy Deposition Modeling and Quench Stability of the APS USC0 Undulator

Monday 11 May 2015 at 15:30 (00h45')

### Content :

A MARS15 model of the USC0 undulator has been developed. The model includes the superconducting NbTiCu coils with epoxy insulating coating, steel yokes supporting the windings and aluminum beam pipe. The study is aimed on calculations of energy deposition inside undulator which occur if the electron beam with energy of 7 GeV (24 bunches with charge 15.3 nC in each) hits the beam pipe due to an accident. Different grazing angles in the center or at the edge of the undulator are investigated. The limits of fast beam loss for various coil currents and beam loss duration are found. It is shown that for the case of slow loss (of about 100 turns) a few percent loss can result in a quench in the windings. For the case of fast loss (of about one turn) the limit is much tighter so that a loss of few hundredths percent leads to a quench.

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**Type** : Abstract