

Oscillating taper in Puffin

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1 Usage instruction and short description of changes

The oscillating taper in Puffin is applied via modification in taper subroutine (file HwigglerVar.fg90 subroutine getAlpha, line 38). The modification also trigger other changes in FreadData.f90, EDerivGlobals.f90 and Lattice.f90 (this one allows user to use new type of undulator - UNOS, which uses two additional parameters). All above modification allow user to control the oscillating taper either via main file or lattice file. In the main file user should define three variables:

- $qUndFreq = 1.0$ / this defines how often the a_w varies over ONE period of undulator, here 1.0 means it will have one full sine cycle over one period of undulator, 2.0 will force two full sine oscillations over one period of undulator etc..
- $qUndAmpl = 25.0$ / defines the amplitude of sine oscillation, 25 means that the change allows to oscillate a_w +/- 25%

By default the $qUndFreq = 0.0$ and thus neglecting the whole oscillation term. If user is using the lattice file then instead of using 'UN' type undulator 'UNOS' should be used and two additional parameters should be added at the end of the line, e.g.:

UNOS 'planepole' 6 1.0 0.0 10 1.0 1.0 0.0 0.0 25.0 1.0

The last parameter is the oscillation frequency and the one before is amplitude.