I am in accord with Pascal's suggestion to use the DSST for the OsculatingToMeanElementsConverter.

Walter's paper (1967) provides a good description of the osculating to mean process [see Eqs (12) and (13) and associated discussion]. While Walter was motivated by the osculating to mean problem associated with the Brouwer and Kozai analytical theories, the same analysis applies to the osculating to mean process for the DSST.

The osculating to mean element process described by Walter is iterative and the only inputs are the osculating elements at the same time epoch as the epoch for the desired mean elements.

As with all numerical processes, it is good to understand the errors in the final product.

The Orekit DSST currently includes the short-periodic motion terms:

- zonal harmonics in the geopotential
- tesseral m-daily terms due to geopotential
- tesseral linear combination terms due to geopotential
- lunar-solar time-independent terms (lunar-solar point masses)

All of these contributions are 'first order' in the respective small parameters. There are degree and order limits associated with the tesseral terms.

The terms that are not included in the Orekit DSST short-periodic motion model are:

- J2-squared terms
- J2 secular/m-daily coupling terms
- Shallow resonance terms not included in the mean element equations of motion and not included in the current tesseral m-daily and linear combination models
- J2 secular/tesseral shallow resonance coupling for shallow resonance terms not included in the mean element equations of motion
- lunar-solar weak time dependent (WTD) short-periodic motion terms

The lunar-solar weak time dependent (WTD) short-periodic motion terms are important for MEO, HEO, and GEO orbits.

Of the terms that are not included in the current Orekit DSST short-periodic motion model, the following have been included in the F77 DSST Standalone program (ref Srinivas et al, 2016):

- J2-squared terms

- J2 secular/m-daily coupling terms
- a small eccentricity approximation for lunar-solar weak time dependent (WTD) short-periodic motion terms
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