

## Orekit - Bug #351

### PartialDerivativesEquations does not work with non-Cartesian elements

2017-08-11 15:57 - Evan Ward

<b>Status:</b>	New	<b>Start date:</b>	2017-08-11
<b>Priority:</b>	Normal	<b>Due date:</b>	
<b>Assignee:</b>		<b>% Done:</b>	0%
<b>Category:</b>		<b>Estimated time:</b>	0.00 hour
<b>Target version:</b>			
<b>Description</b>			
<p>Using PDE with the propagator's orbitType set to a non-Cartesian value does not produce meaningful results. See the discussion on the dev list: <a href="https://www.orekit.org/wvs/arc/orekit-developers/2017-08/msg00010.html">https://www.orekit.org/wvs/arc/orekit-developers/2017-08/msg00010.html</a></p> <p>One workaround is to compute the STM in Cartesian elements and then transform it to the desired element set using equation 7.32 in Montenbruck &amp; Gill:</p> $\text{STM}(\text{Keplerian}) = \text{d}(\text{kep})/\text{d}(\text{cart}) * \text{STM}(\text{Cartesian}) * (\text{d}(\text{kep})/\text{d}(\text{cart}) )^{-1}$ <p>Another workaround is to use a FieldNumericalPropagator with the orbitType set to the desired value, and then extract the STM from the final orbital elements.</p>			