Description

Your numerical model should be verified before it can be validated. An excellent opportunity for system tests is naturally to compare the results of your numerical model with the verification model. However, this does not guarantee that the numerical model is correct, since it has not been established yet that the verification model is correct. Therefore, you should also verify your own numerical model itself by performing independent unit and system tests. The verification model may be assumed to work correctly (as long **as the assumptions made by the model are valid**) and thus does not necessarily need to be checked. Nonetheless, you are encouraged to be critical of the verification model and to report any checks you have performed, although you are not required or expected to do so.

As mentioned previously, the verification of your numerical interpolation and integration routines should not rely on any existing modules that offer the same capabilities; the verification should be performed independent of any existing functions and modules. Thus, as a minimum, provide the following:

- Independent verification of your own numerical model including unit tests and possibly system tests (results only for final report).

- Comparison between the results of the verification model and your numerical model, including appropriate system tests (results only for final report)

Note: Make sure that you are specific in describing your verification and validation strategies (particularly for the simulation plan). You do not have to explain what verification and validation mean as a concept; you may assume the reader to be well aware of this. Rather, you should detail how you plan on verifying and validating your model. Thus, avoid vague descriptions such as “The results of the validation data and the numerical model will be compared”, without specifying how you will compare them (how do you define the error between them, for example).

In the verification part of the simulation plan, all proposed tests have to be included. It should be made clear why these tests are chosen (see section 3-2) and where the test data is coming from (e.g. hand calculations, literature). Tests of small units typically result in two numbers that agree to computer precision, but larger tests might show discrepancies with respect to the reference data because no reference data is available or an analytical model can not be generated for exactly the part of the program that is being verified. It should be explained why you expect that discrepancies arise and how they affect verification (for example, which error is considered acceptable for verification?). Verification will take place for many parts of the software and will point at errors in the code**. A strategy should be given for locating where errors in the code are, how to correct them, and how to test if the errors are eliminated**

Terminology

**Verification** is to determine if a simulation model accurately represents the chosen physical model

**Unit testing** is the method of testing various isolated software components separately.

**System testing** is the technique in which the entire system is exercised with a series of the different tests.

Build up

Description of the used verification model, why is it a good model to verify numerical model and all assumptions identified.

How are we going to make the comparison? Using unit (also check for singularities) and system tests. Accuracy of these tests must be given and motivated (like in textbook???). Show (try) that these test cover the entire model.