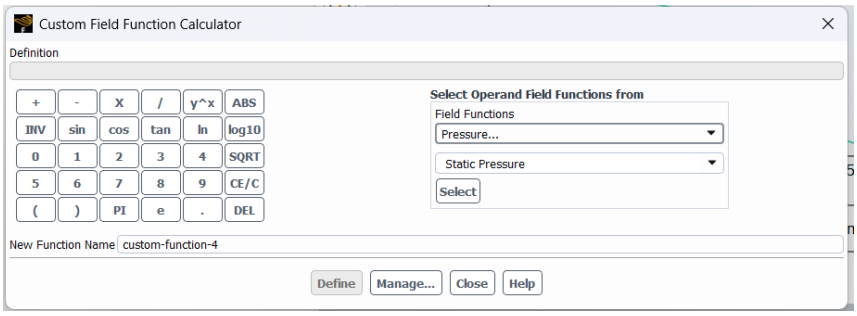
Hands-on session 4 – Turbulent Pipe Flow - Addendum

1 Custom Field Functions

It is often useful to create your own field functions to plot variables which are not readily available in Fluent. For example the Reynolds stresses. The average user does not need those values, so they are not included, but the detailed user might want to use them for comparison or analysis.

1.1 Create a custom function for the streamwise variance

In Parameters & Customization, right click on Custom Field Functions -> New. The following panel will open.



The user can then manipulate existing, or newly defined functions to obtain not existing quantities which characterize the flow. Such as variances or Reynolds stresses. The streamwise variance is defined as:

$$u_z' = 2\nu_t \frac{\partial W}{\partial z} - \frac{2}{3}k$$

Where W is the streamwise velocity and z is the streamwise direction.

Use the functions on the right (remember to click select) and the operators on the left to write what appears in the definition below according to your geometries. In this case for example, y was the streamwise direction. Give a proper name to the function. Once the definition is completed click Define. Note: you cannot modify the function after you define it.