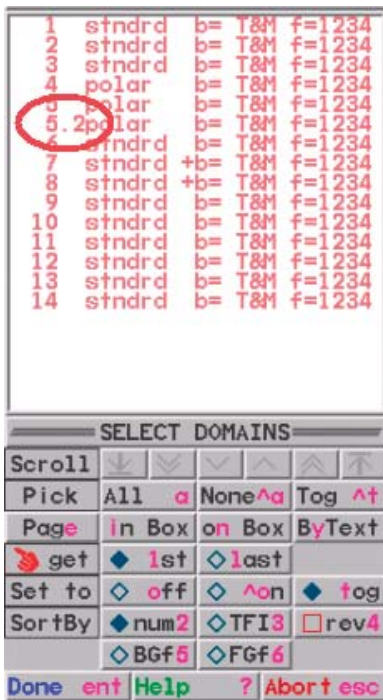


# POINTWISE POINTER

A USER TIP FROM THE SUPPORT DESK  
FALL 2001

## SubGrids



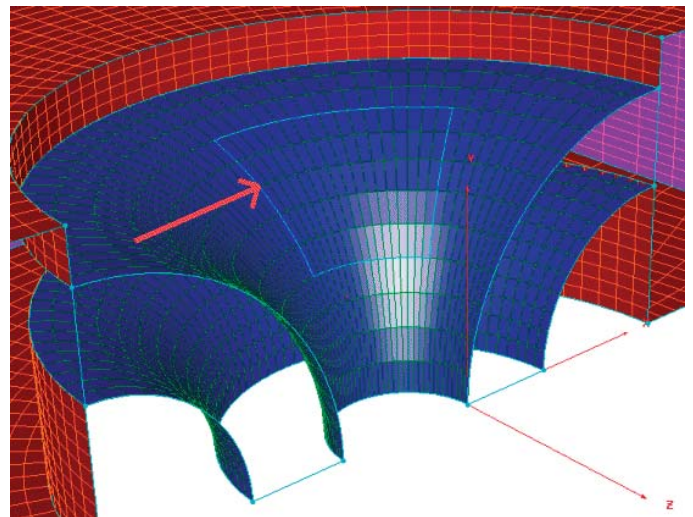
This issue of the Pointer will cover a largely overlooked tool in Gridgen: SubGrids for structured domains and blocks. SubGrids are simply a sub-set of a domain or block interior and are defined interactively using the **Modify** command at the domain or block level. They also are created automatically when two or more domains or blocks have been joined. The original domains or blocks become SubGrids of the new joined entities.

SubGrids can only be used in the Structured Solver. Therefore, they are not visible in the GUI except when you are using the structured solver. At that time they appear in the display window very similar to normal domains or blocks, except that they do not have nodes at the corners since there are no true connectors on their edges. In the browser list they appear with the same number as the parent domain appended with a period and a sequential number, starting with "2" (since the entire grid is SubGrid number 1).

SubGrids are very useful in cases where you have a dimensionally large domain or block that needs elliptic smoothing, but only needs smoothing in a small isolated portion of the interior. You can simply create a SubGrid encompassing the portion of the domain or block that needs smoothing and select that SubGrid in the solver browser for use in the solver. Now the grid can be improved much more efficiently since only a small portion is being run through the solver. Once you exit the solver, the SubGrid portion becomes a permanent piece of an otherwise un-smoothed entity.

Another handy use for SubGrids is the ability to use a TFI (Transfinite Interpolation) method on only a portion of a domain or block. For instance, if an entire domain or block has been elliptically smoothed, and for some reason the results are not desirable in a limited portion of the entity, the user can create a SubGrid for that portion and re-TFI it. This will return the SubGrid to a TFI definition while the remainder of the grid is still elliptically smoothed.

To create a SubGrid in an existing structured domain, proceed to the Domain Commands menu and press **Modify**. Select the domain from the browser list or in the display window, and press **Done**. Press the **SubGrids Add** button.



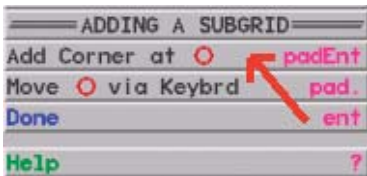
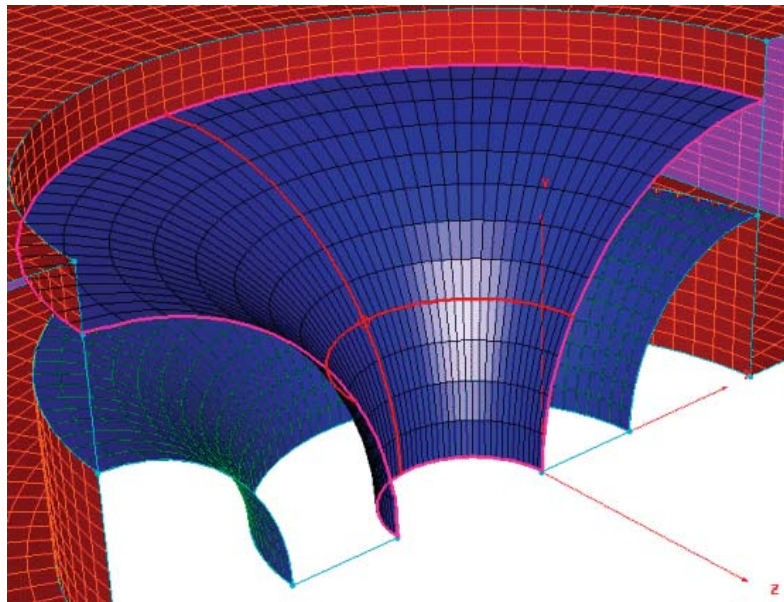
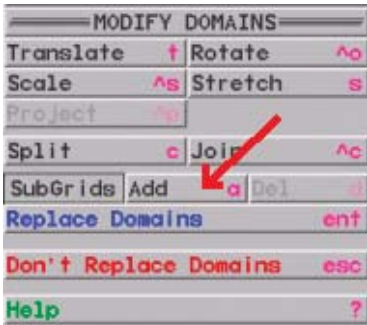
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Next you will see the domain rendered with a highlighter, as shown in the image below, similar to the one used in the domain **Examine** command. Use the highlighter to define the opposing corners of the new SubGrid. Press and hold the **right mouse** button to move the intersection of the highlighter, which is denoted with an open circle, to the first corner.

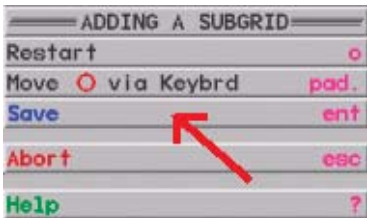
Press **Add Corner** at  $\bigcirc$ . Now again press and hold the right mouse to move the highlighter intersection to the opposing corner of your SubGrid and press **Save**. You have now defined your first SubGrid for that domain. You can proceed immediately to add others without leaving this menu. You can create as many as you wish, and they may overlap in any fashion.

SubGrids for structured blocks are created in an almost identical fashion except the construction tool is a computational scan plane with the highlighter positionable on that plane. Moving the highlighter and the scan plane allows definition of the opposing corners of the block SubGrid.

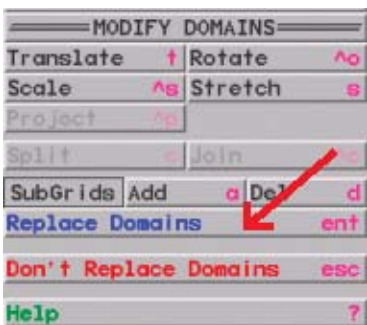


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