Cook's membrane geometry and mesh

Problem definition

In ParaView generate quadrilateral mesh for Cook's membrane.

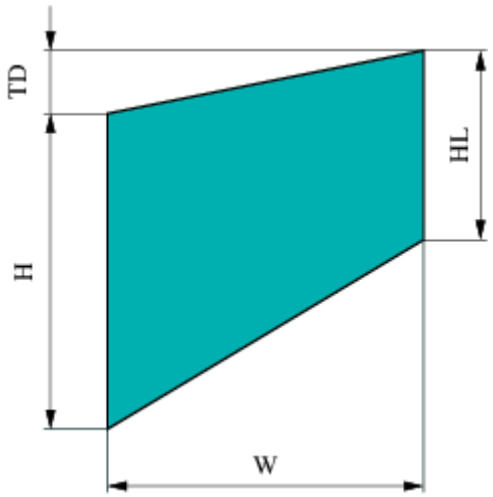

Figure source in FIG format

Solution

The geometry is parametrized by four parameters:

- Width W
- Height H
- Height of the east edge HL
- Top right corner displacement TD

The solution is to define displacement field that deforms the unit square into desired shape via “Wrap by vector” filter. The displacement field is defined as the sum of three displacement fields:

- U1 - responsible of scaling unit square into W by H rectangle : $[x\cdot W, y\cdot H]$
- U2 - responsible of scaling east edge from length H to length HL : [0, -(H-HL)\cdot x\cdot y]$.
- U3 - responsible of translating east edge vertically by distance H+TD-HL : $[0, (H+TD-HL)\cdot x]$.

Here one can find

ParaView state file with the solution

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