

Block Structured Mesh

BlockMesh.cs

Two 2nd rank tensors serve as storage for node variable values (node vars):

$\mathbf{u}_{\triangleright}$ with components u_{\triangleright}^{jl}	Tensor Uf	free node vars ,
$\mathbf{u}_{\triangleleft}$ with components u_{\triangleleft}^{jl}	Tensor Uc	constrained node vars .

First slot (j) signifies node position, while the second (l) marks a dependent variable. For both tensors the first slot's dimension is N (nodes) while the second slot's dimension is m (vars). The two tensors hold mutually exclusive information - if the component $u^{5,4}$ appears in $\mathbf{u}_{\triangleright}$, it cannot appear in $\mathbf{u}_{\triangleleft}$ because a variable is either constrained or it isn't.

The sum of them thus produces a tensor which holds all values:

$\mathbf{u}_{\bowtie} = \mathbf{u}_{\triangleright} + \mathbf{u}_{\triangleleft}$	Tensor U	all = free + constrained .
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Here \mathbf{U} is a method that can access values from both \mathbf{Uf} and \mathbf{Uc} - it retrieves the value from the correct source. A third 2nd rank tensor stores all forcing vars (right-hand side of PDE):

\mathbf{f}_{\bowtie}	Tensor F	forcing vars .
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