Table 1: Field types for staggered, uniform meshes. We employ stronger typing than Uintah to allow more reasoning among field types.

Field Type	Scalar CC Offset (σ)	Uintah Field Type	Extra (x, y, z) at +BC[1] (ϵ^{BC})
SVol	(0,0,0)	CC	(0,0,0)
SSurfX	(-1,0,0)	SFCX	(1,0,0)
SSurfY	(0,-1,0)	SFCY	(0,1,0)
SSurfZ	(0,0,-1)	SFCZ	(0,0,1)
XVol	(-1,0,0)	SFCX	(1,0,0)
XSurfX	(0,0,0)	CC	(0,0,0)
XSurfY	(-1,-1,0)	SFCY	(0,1,0)
XSurfZ	(-1,0,-1)	SFCZ	(0,0,1)
YVol	(0,-1,0)	SFCY	(0,1,0)
YSurfX	(-1,-1,0)	SFCX	(1,0,0)
YSurfY	(0,0,0)	CC	(0,0,0)
YSurfZ	(0,-1,-1)	SFCZ	(0,0,1)
ZVol	(0,0,-1)	SFCZ	(0,0,1)
ZSurfX	(-1,0,-1)	SFCX	(1,0,0)
ZSurfY	(0,-1,-1)	SFCY	(0,1,0)
ZSurfZ	(0,0,0)	CC	(0,0,0)

Table 2: Here α indicates the direction of action for the operator, s subscripts indicate a source field, and d subscripts indicate a destination field.

Quantity	Description	Formula
α	Direction of application for the operator	Unit vector given by $\sigma_s - \sigma_d$
$so^{(1)}$	The offset for the first source field window	(0,0,0)
$so^{(2)}$	The offset for the second field window	$\delta_{i,\alpha}$
do	The offset for the destination field window	$(\epsilon_d[x]\delta_{x,\alpha}, \epsilon_d[y]\delta_{y,\alpha}, \epsilon_d[z]\delta_{z,\alpha})$
si^{BC}	Amount to add to si when a physical BC is present in the direction of interest	$(0, \sigma_s[x]\sigma_d[x], \sigma_s[y]\sigma_d[y])$
di^{BC}	Amount to add to di when a physical BC is present in the direction of interest	$(0, \sigma_s[x] - \sigma_d[x], \sigma_s[y] - \sigma_d[y])$

Table 3: Two-Point Stencil information

Src Field	Dest Field	Dir	Src1 Offset	Src2 Offset	Extent Augment	BC Extent Augment[2]	Dest Offset	Extent Augment	BC Extent Augment[3]
SVol	SSurfX	x	(0,0,0)	(1,0,0)	(-1,0,0)	(0,0,0)	(1,0,0)	(-1,0,0)	(-1,0,0)
SVol	SSurfY	y	(0,0,0)	(0,1,0)	(0,-1,0)	(0,0,0)	(0,1,0)	(0,-1,0)	(0,-1,0)
SVol	SSurfZ	z	(0,0,0)	(0,0,1)	(0,0,-1)	(0,0,0)	(0,0,1)	(0,0,-1)	(0,0,-1)
SSurfX	SVol	x	(0,0,0)	(1,0,0)	(-1,0,0)	(0,0,0)	(0,0,0)	(-1,0,0)	(1,0,0)
SSurfY	SVol	y	(0,0,0)	(0,1,0)	(0,-1,0)	(0,0,0)	(0,0,0)	(0,-1,0)	(0,1,0)
SSurfZ	SVol	z	(0,0,0)	(0,0,1)	(0,0,-1)	(0,0,0)	(0,0,0)	(0,0,-1)	(0,0,1)
XVol	XSurfX	x	(0,0,0)	(1,0,0)	(-1,0,0)	(0,0,0)	(0,0,0)	(-1,0,0)	(1,0,0)
XVol	XSurfY	y	(0,0,0)	(0,1,0)	(0,-1,0)	(-1,0,0)	(0,1,0)	(0,-1,0)	(-1,-1,0)
XVol	XSurfZ	z	(0,0,0)	(0,0,1)	(0,0,-1)	(-1,0,0)	(0,0,1)	(0,0,-1)	(-1,0,-1)
XSurfX	XVol	x	(0,0,0)	(1,0,0)	(-1,0,0)	(0,0,0)	(1,0,0)	(-1,0,0)	(-1,0,0)
XSurfY	XVol	y	(0,0,0)	(0,1,0)	(0,-1,0)	(0,0,0)	(0,0,0)	(0,-1,0)	(0,1,0)
XSurfZ	XVol	z	(0,0,0)	(0,0,1)	(0,0,-1)	(0,0,0)	(0,0,0)	(0,0,-1)	(0,0,1)
YVol	YSurfX	x	(0,0,0)	(1,0,0)	(-1,0,0)	(0,0,0)	(1,0,0)	(-1,0,0)	(-1,0,0)
YVol	YSurfY	y	(0,0,0)	(0,1,0)	(0,-1,0)				
YVol	YSurfZ	z	(0,0,0)	(0,0,1)	(0,0,-1)		(0,0,1)		
YSurfX	YVol	x	(0,0,0)	(1,0,0)	(-1,0,0)		(0,0,0)		
YSurfY	YVol	y	(0,0,0)	(0,1,0)	(0,-1,0)		(0,1,0)		
YSurfZ	YVol	z	(0,0,0)	(0,0,1)	(0,0,-1)		(0,0,0)		
ZVol	ZSurfX	x	(0,0,0)	(1,0,0)	(-1,0,0)	(0,0,0)	(1,0,0)		(0,1,0)
ZVol	ZSurfY	y	(0,0,0)	(0,1,0)	(0,-1,0)	(0,0,0)	(0,1,0)		(0,0,1)
ZVol	ZSurfZ	z	(0,0,0)	(0,0,1)	(0,0,-1)	(0,0,0)	(0,0,0)		(0,0,0)
ZSurfX	ZVol	x	(0,0,0)	(1,0,0)	(-1,0,0)	(0,0,0)	(0,0,0)		(0,-1,0)
ZSurfY	ZVol	y	(0,0,0)	(0,1,0)	(0,-1,0)	(0,0,0)	(0,0,0)		(0,0,-1)
ZSurfZ	ZVol	z	(0,0,0)	(0,0,1)	(0,0,-1)	(0,0,0)	(0,0,1)		(0,0,0)

Table 4: Two-Point Stencil information

Src Field	Dest Field	Dir	Src1 Offset	Src2 Offset	BC Src Inc. Augment[4]	Dest Offset	BC Dest Inc. Augment[5]
XVol	SVol	x	(0,0,0)	(1,0,0)	(0,0,0)	(0,0,0)	(0,-1,0)
XVol	YSurfX	y	(0,0,0)	(0,1,0)	(0,0,0)	(0,1,0)	(0,0,0)
XVol	ZSurfX	z	(0,0,0)	(0,0,1)	(0,0,0)	(0,0,1)	(0,0,0)
YVol	XSurfY						
YVol	ZSurfY						