

***ALE_STRUCTURED_MESH_MOTION**

Purpose: This keyword controls the motion of a structured 3D ALE mesh generated by *ALE_STRUCTURED_MESH.

Include as many of the following card as needed. This input ends at the next keyword (“*”) card. Each card represents a mesh motion operation. For now, there are two options to control S-ALE mesh motion.

1. FOLLOW_GC: to make the mesh follow the mass center of certain fluid(s) in the mesh and expand/contract the mesh at the same rate as those fluid(s). A typical example is to model a moving projectile hitting a target.
2. COVER_LAG: to make the mesh follow the motion of a Lagrangian structure and expand/contract so that the Lagrangian structure is fully covered in the S-ALE mesh. It is most useful to model airbag deployment.

For option FOLLOW_GC, the card format is as follows.

Card 1	1	2	3	4	5	6	7	8
Variable	MSHID	OPTION	AMMGSID	EXPLIM				SYMCOD
Type	I	A	I	F				I
Default	none	none	0	1.0				0

VARIABLE**DESCRIPTION**

MSHID	S-ALE Mesh ID. Defined in *ALE_STRUCTURED_MESH.
OPTION	FOLLOW_GC
AMMGSID	The set of ALE multi-material group list IDs which the mesh follows. Please refer to *SET_MULTI-MATERIAL_GROUP_LIST card for details.
EXPLIM	Limit ratio for mesh expansion and contraction. The distance between the nodes is not allowed to increase by more than a factor EXPLIM or decrease to less than a factor 1/EXPLIM. Default value of 1.0 means no expansion/contraction.

VARIABLE	DESCRIPTION
SYMCOD	<p>A three digit number to define symmetry. Each digit specifies one direction (local x,y,z defined in *ALE_STRUCTURED_MESH) and can be of 0,1 or 2. Code 0 means no symmetry; 1 symmetry defined at minus face; 2 plus face. Hundredth x, tenth y, ones z.</p> <p>For example: 201 means quarter symmetry with symmetry planes at +x and -z face. 111 means 1/8 symmetry with symmetry planes at -x,-y and -z face.</p>

For option COVER_LAG, the card format is as follows.

Card 1	1	2	3	4	5	6	7	8
Variable	MSHID	OPTION	SID	STYPE	NODCEN		FRCPAD	
Type	I	A	I	I	I		F	
Default	none	none	none	0	none		0.1	

VARIABLE	DESCRIPTION
MSHID	S-ALE Mesh ID. Defined in *ALE_STRUCTURED_MESH.
OPTION	COVER_LAG
SID	Set ID to identify the Lagrange structure.
STYPE	Set type: EQ.0: part set EQ.1: part EQ.2: segment set EQ.3: node set
NODCEN	Node ID used as the center of mesh expansion. Optional.

VARIABLE	DESCRIPTION
FRCPAD	<p>FRCPAD is to add an extra few layers of ALE elements beyond the Lagrangian structure. This way, the fluid structure interaction (FSI) does not happen at the ALE mesh boundary.</p> <p>A value of FRCPAD=0.1 would add an extra padding of 0.1*total length at each face along each direction.</p>