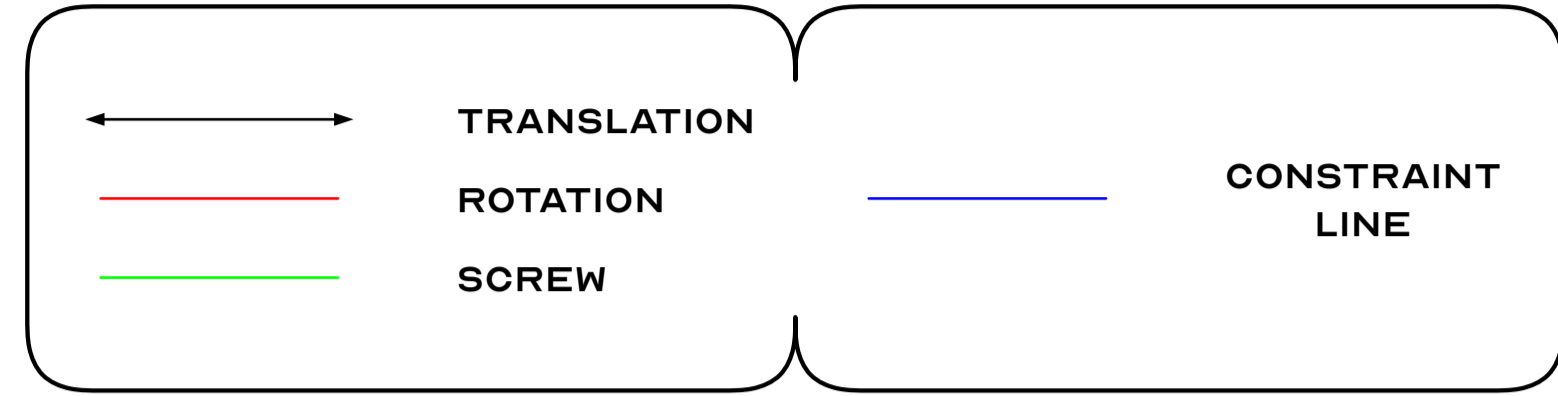


FREEDOM AND CONSTRAINT TOPOLOGY DESIGN CHART

LEGEND:



DOF-2

DOF-3

DEGREES OF FREEDOM:

ONE WIRE CONSTRAINS ONE DEGREE OF FREEDOM IN AN EXACTLY CONSTRAINED FLEXURE. REDUNDANT WIRES RESULT IN OVER CONSTRAINED FLEXURE. ONLY SERIAL IS UNDER CONSTRAIN.

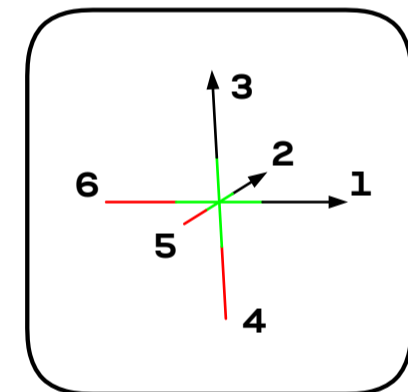
FLEXURE ELASTIC DEFORMATION:

ELONGATION@YIELD \approx $\frac{\text{DEFORMATION} \times \text{THICKNESS}}{\text{LENGTH}^2}$, FOR ARC DEFORMATION.
 $4 \times \frac{\text{DEFORMATION} \times \text{THICKNESS}}{\text{LENGTH}^2}$, FOR PARALLEL DEFORMATION.

SCREWS:

FOR A SCREW MOTION, PITCH IS DEFINED AS A TRANSLATION OVER ROTATION RATIO, WHERE
 $\text{PITCH} = \text{DISTANCE} \times \tan(\text{ANGLE@WIRES})$

6 DEGREES OF FREEDOM:



SERIAL / PARALLEL:

FOR A SERIAL FLEXURE, FINAL FREEDOM SPACE IS A SUM OF INTERMEDIATE FREEDOM SPACES. FOR A PARALLEL FLEXURE, INTERSECTION DEFINES A NEW FREEDOM SPACE.

DOF-1

DOF-4

DOF-5

DOF-0

