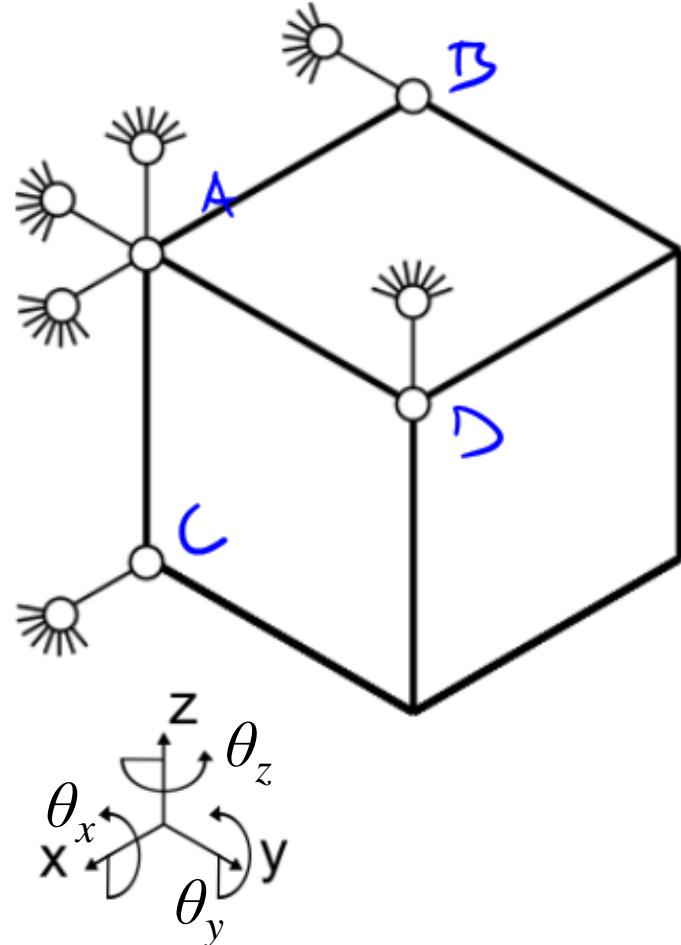


Constraints and Statical Determinacy (3D)

Example 1:



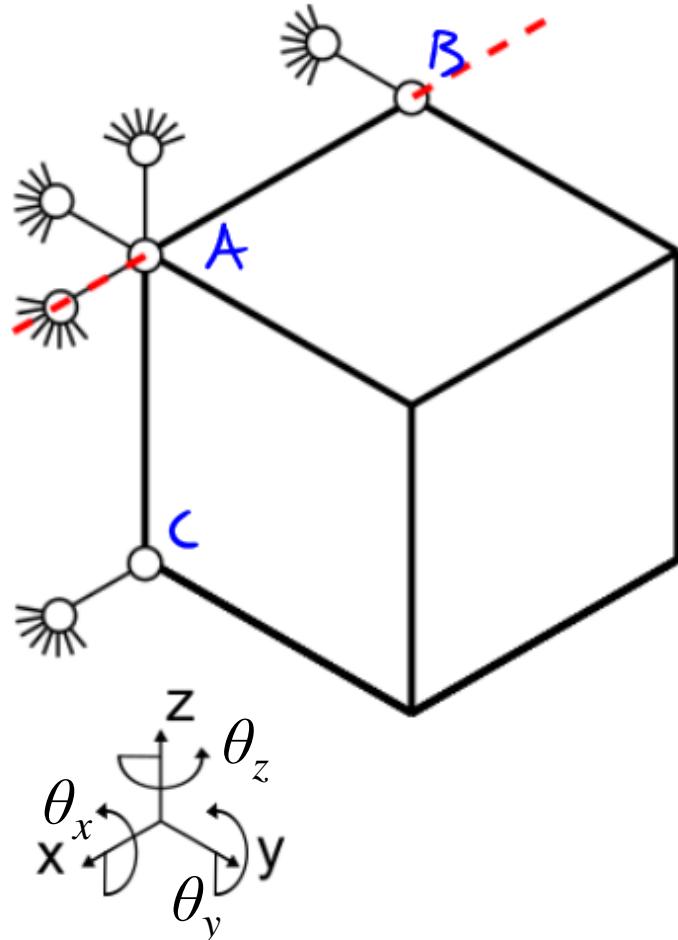
Kinematic Analysis:

- **A** blocks translations: u_x , u_y , u_z
- + **B** blocks rotation: θ_z
- + **C** blocks rotation: θ_y
- + **D** blocks rotation: θ_x

→ **Isostatic (Statically determinate)
(Kinematically determinate)**

Constraints and Statical Determinacy (3D)

Example 2:



Kinematic Analysis:

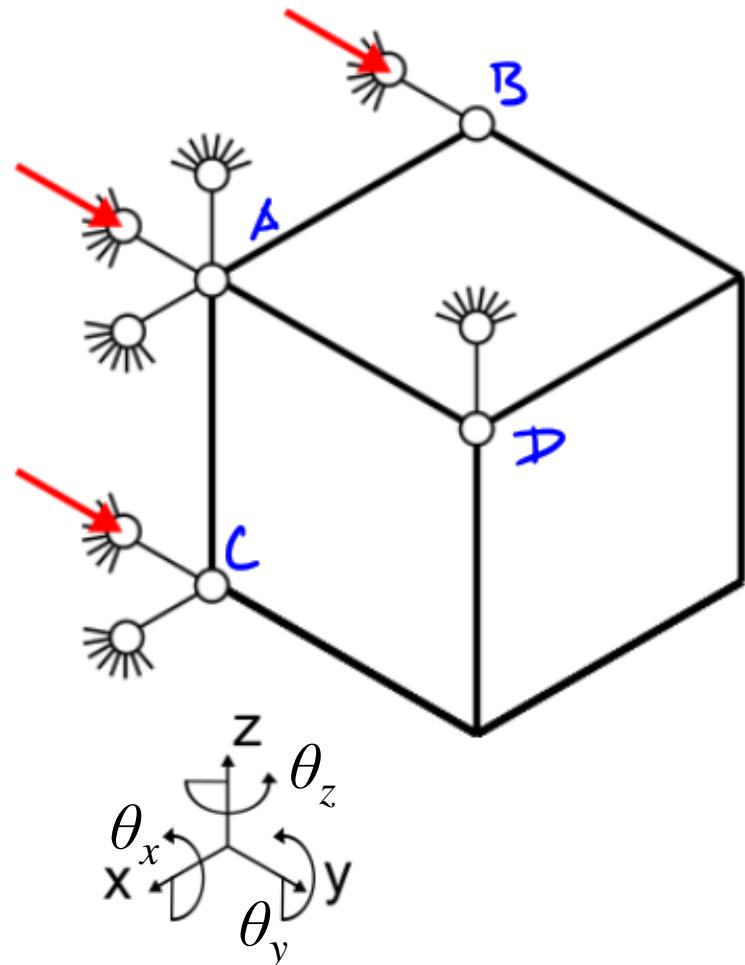
- **A** blocks translations: u_x , u_y , u_z
- + **B** blocks rotation: θ_z
- + **C** blocks rotation: θ_y

Rotation θ_x is still allowed.

→ **Hypostatic**
Kinematically indeterminate

Constraints and Statical Determinacy (3D)

Example 3:



Kinematic Analysis:

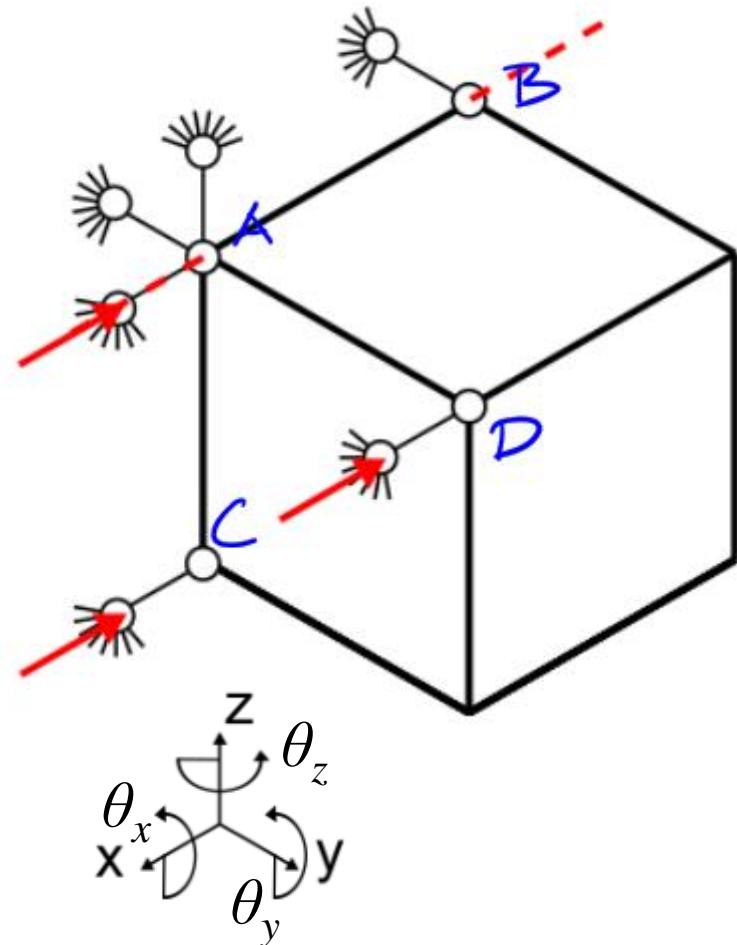
- A blocks translations: u_x, u_y, u_z
- + B blocks rotation: θ_z
- + C blocks rotations: θ_x, θ_y
- + D blocks rotation: θ_x , (again!)

There is a redundant constraint.

→ **Hyperstatic (statically indeterminate)
Kinematically determinate**

Constraints and Statical Determinacy (3D)

Example 4:



Kinematic Analysis:

- **A** blocks translations: u_x, u_y, u_z
- + **B** blocks rotation: θ_z
- + **C** blocks rotations: θ_y
- + **D** blocks rotation: θ_z , (again!)

There is a redundant constraint in θ_z .
There is a degree of freedom θ_x

→ **Statically & kinematically indeterminate**
Hyper-and-Hypostatic