Seamless operability quantification using **opyrability**: *multimodel_rep* and *OI_eval*

(A) CSTR temperature controller

Pure A enters reactor of radius R, with $T_{reaction}$ controlled by TC.

Irreversible reactions
$$A \longrightarrow B \, (2^{nd} \, order)$$
$$A \longrightarrow C \, (1^{st} \, order)$$

Outputs: C_A, C_B, C_C
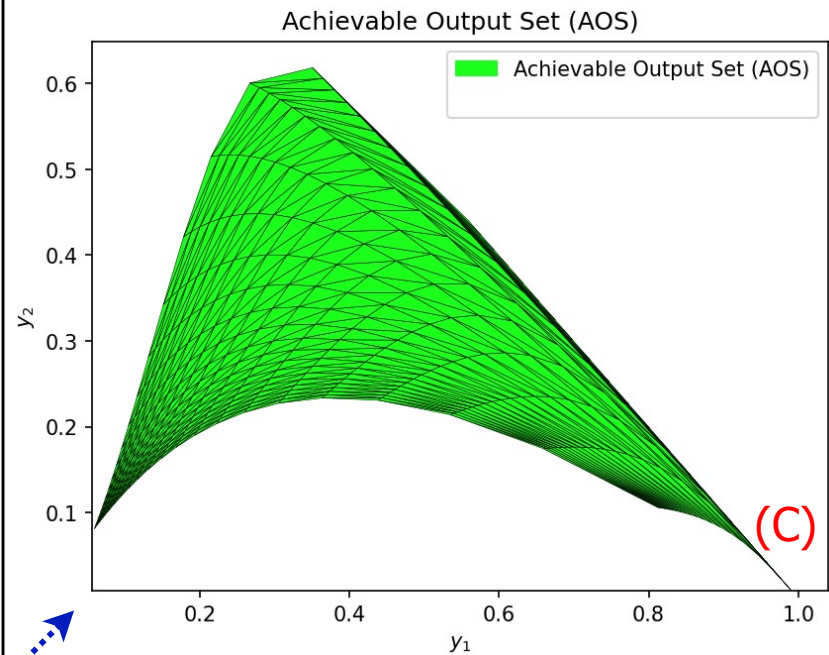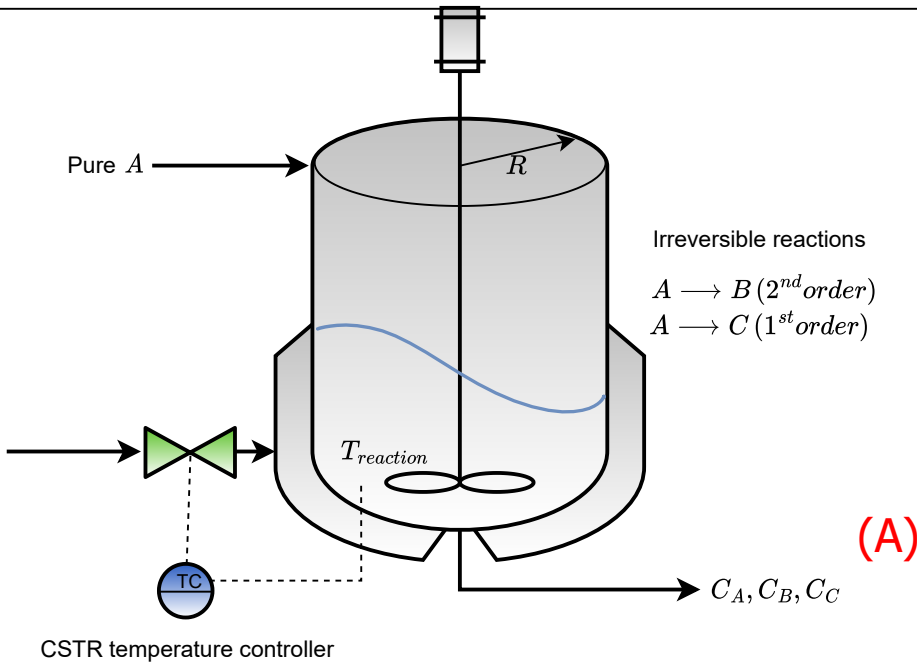
(B)
```python
from opyrability import multimodel_rep, OI_eval

# AIS Bounds
AIS_bounds = np.array([[0.25,  3.00],
                       [1.00, 15.00]])

# Discretization Resolution
AIS_resolution = [20, 20]

# Obtain AOS
AOS_region = multimodel_rep(CSTR,
                            AIS_bounds,
                            AIS_resolution)

# DOS Bounds and resolution
DOS_bounds = np.array([[0.10,  0.35],
                       [0.45,  0.65]])

# Obtain Operability Index (OI)
OI = OI_eval(AOS_region, DOS_bounds)
```
[3] ✓ 4.3s   Python

(C) Achievable Output Set (AOS)

Legend: Achievable Output Set (AOS)

Axes: y_1 (horizontal), y_2 (vertical)

(D) Operability Index Evaluation - Outputs' Perspective

Legend:
- Desired Output Set (DOS)
- Achievable Output Set (AOS)
- $AOS \cap DOS$
- Operability Index = 39.14%

Axes: y_1 (horizontal), y_2 (vertical)