

# Temporal performance analysis

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## Step 1: initialization

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From desired initial chamber pressure and OF ratio, the code computes  $R_i^0$ ,  $\dot{m}_{\text{ox}}^0$  and  $C_{\text{guess}}^*$ . The code does not care about outer radius and the user should check that it is always greater than the inner radius.

## Step 2: solve

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Then, the input for the temporal analysis is a profile  $\dot{m}_{\text{ox}}^i$ . The sequence of operations are:

1. Get  $R_i^{i+1}$  using a basic forward Euler
2. Get  $\dot{R}_i^{i+1}$ ,  $\dot{m}_{\text{fuel}}^{i+1}$  and  $\text{O/F}^{i+1}$
3. Get  $p_c^{i+1} = C^{*,i} \dot{m}^{i+1} / A_t$  (lagged  $C^*$ )
4. Recompute  $\gamma$  and  $C^{*,i+1}$  from  $p_c^{i+1}$ ,  $\text{O/F}^{i+1}$
5. Get  $C_F$  from  $p_c^{i+1}$  and  $\gamma$
6. Get  $T^{i+1} = p_c^{i+1} A_t C_F$

$C_{\text{guess}}^*$  is used for the initialization following the same procedure.