Here are the parameters you’ll need:

AMOCParams['Tstar\_L'] = AssignQuantity(10, 'celsius') # Prescribed atmospheric temperature low latitude box  
AMOCParams['Tstar\_H'] = AssignQuantity(7, 'celsius') # Prescribed atmospheric temperature high latitude box

AMOCParams['gamma\_L'] = AssignQuantity(1/11.8, 'years\*\*-1') # Low-latitude box thermal restoring rate  
AMOCParams['gamma\_H'] = AssignQuantity(1/2.4, 'years\*\*-1') # High-latitude box thermal restoring rate  
AMOCParams['V\_L'] = AssignQuantity(3.2e16,'m\*\*3') # Low-latitude box volume  
AMOCParams['V\_H'] = AssignQuantity(3.8e15,'m\*\*3') # High-latitude box volume  
AMOCParams['beta\_S'] = AssignQuantity(.75, 'kg/g') # Saline expansion coefficient   
AMOCParams['beta\_T'] = AssignQuantity(1.0e-4,'1/K') # Thermal expansion coefficient  
AMOCParams['F\_e'] = AssignQuantity(0.21,'(hm^3/s)') # Freshwater transport across the OSNAP section, in Sverdrups (=hm^3/s)  
AMOCParams['S\_0'] = AssignQuantity(35/1000,' dimensionless') # Reference salinity (dividing by 1000 to convert parts per thousand to fraction)  
AMOCParams['rho\_0'] = AssignQuantity(1027,'kg/m\*\*3') # Reference density  
AMOCParams['k'] = AssignQuantity(23.7, '(hm^3/s)/(kg/m\*\*3)') # Hydraulic constant, in Sverdrups / density

In your PropagateAMOCState, after getting out the above parameters, you’d need to calculate

Then you’d need to solve the prognostic equations

For example, the first equation would be accomplished by something like

Flux\_TL = gamma\_L\*(Tstar\_L-TL) + qabs/V\_L\*(TH-TL)

TL += Flux\_TL\*dtime

For starting conditions, I think the following works:

# Starting AMOC state

dtime = AssignQuantity(0.1,'year')

AMOCState = {}

AMOCState['SL'] = AMOCParams['S\_0']

AMOCState['SH'] = AMOCParams['S\_0']

AMOCState['TL'] = AMOCParams['Tstar\_L']

AMOCState['TH'] = AMOCParams['Tstar\_H']

AMOCState['time'] = -dtime

It seems that salinities reach their steady-state values after less than one year, but temperatures require a few decades to get to their steady-state values.