Values to be guessed

$\vec{\rho}^{(0)}$ - the initial distribution of coolant density has to be guessed (uniform distribution is OK),

b - neutron batchsize (I recommend to set the batchsize $b \leftarrow 500$ for the optimal convergence),

s_1 - the number of neutrons to be simulated in all cycles of the first iteration step needs to be guessed (choose this number so that the active cycles of the MC code run about a minute),

- initial fission source distribution at each iteration step must be guessed. It may not be the best idea to use the fission source from the previous iteration step. Try the uniform distribution; you may get better results.

- the number of inactive cycles in the MC calculation at each iteration step (I'd choose a few dozens of them)

Description of the coupling scheme

Algorithm 1 Basic scheme for coupled NK-TH calculations

input: s_1, b, $\vec{\rho}^{(0)}$
$S_0 \leftarrow 0$
for $i \leftarrow 1, 2, \dots$ **do**
  $s_i \leftarrow (s_1 + \sqrt{s_1^2 + 4 s_1 S_{i-1}})/2$
  $c_i \leftarrow integer(s_i/b)$
  $\vec{p}^{(i)} \leftarrow$ power distribution in a system with coolant density $\vec{\rho}^{(i-1)}$
    distribution based on MC crit. simulation with c_i active cycles
  $S_i \leftarrow S_{i-1} + s_i$
  $\alpha_i = s_i/S_i$
  $\vec{P}^{(i)} \leftarrow (1-\alpha_i)\vec{P}^{(i-1)} + \alpha_i \vec{p}^{(i)}$
  remormalize $\vec{P}^{(i)}$ so that the system gives required power
  $\vec{\rho}^{(i)} \leftarrow$ calculation of the steady-state coolant density distribution
    based on power distribution $\vec{P}^{(i)}$
end for