

Input: sequences X, Y, Z , Inside matrix α

```
foreach  $n^{(X)} \in \mathcal{F}^{(X)}$  do                                     /* outside→inside sorted */
  foreach  $n^{(Y)} \in \mathcal{F}^{(Y)}$  do                               /* outside→inside sorted */
    foreach  $n^{(Z)} \in \mathcal{F}^{(Z)}$  do                             /* outside→inside sorted */
      foreach state  $b$  do
        bifurcProb  $\leftarrow 0$ ;
        foreach  $(n_O^{(X)}, n_L^{(X)}) \in b_{out,L}(n^{(X)})$  do
          foreach  $(n_O^{(Y)}, n_L^{(Y)}) \in b_{out,L}(n^{(Y)})$  do
            foreach  $(n_O^{(Z)}, n_L^{(Z)}) \in b_{out,L}(n^{(Z)})$  do
              | bifurcProb  $+= \text{calcLBifurcProb}(b; \cdot)$ ;
            end
          end
        end
      end
      foreach  $(n_O^{(X)}, n_R^{(X)}) \in b_{out,R}(n^{(X)})$  do
        foreach  $(n_O^{(Y)}, n_R^{(Y)}) \in b_{out,R}(n^{(Y)})$  do
          foreach  $(n_O^{(Z)}, n_R^{(Z)}) \in b_{out,R}(n^{(Z)})$  do
            | bifurcProb  $+= \text{calcRBifurcProb}(b; \cdot)$ ;
          end
        end
      end
      end
       $\beta_b(n^{(X)}, n^{(Y)}, n^{(Z)}) \leftarrow \text{calcTransEmitProb}(b; n^{(X)}, n^{(Y)}, n^{(Z)})$ ;
       $\beta_b(n^{(X)}, n^{(Y)}, n^{(Z)}) += \text{bifurcProb}$ ;
      store  $\beta_b(n^{(X)}, n^{(Y)}, n^{(Z)})$ ;
    end
  end
end
end
end
```