



I:

$I0_i$: phase-0 insertion of state i

$I1_i$: phase-1 insertion of state i

$I2_i$: phase-2 insertion of state i

\dots : continuing states

i_0 : phase-0 insertion opening weight

i_1 : phase-1 insertion opening weight

i_2 : phase-2 insertion opening weight

e : insertion extension weight in the unit of codon

$\emptyset:NNN$: one codon insertion

$N:N$: nucleotide to nucleotide match