SCHEME 1

Schematic representation of one class of neural interpretations of the model. This example is the direct translation of equations 1 and 2. The membrane potentials ($H_1$ and $H_2$) of two neural populations that encode a pair of competing percept are driven by inputs ($X_i$) that represent a rivalrous or ambiguous stimulus, hence ($X_1=X_2$). Each membrane potential determines its spike rate output via a sigmoidal function ($S$).

Three other signals determine the membrane potential dynamics. First, in blue, the two neural pools cross-inhibit each other ($\gamma S[H_i]$) creating bistability. Second, the membrane potentials have shunting-type gain control (black) controlled by the level of adaptation (purple), the leaky-integral of the neural output. Third, in green, there is a small facilitatory contribution ($\beta A_i$) that also derives from the adaptation mechanism. Note that the black and blue parts have a fast response (< 0.1s), while the green and purple parts are slow (seconds).

This scheme is implemented in the MatLab/Simulink file “scheme_1.mdl”. The preset values of the input stimulus is $T_{on}=1$s, and $T_{off}=2$s which results in repetition of signals only at one output channel. (In Simulink: ‘stimulus’ Period = 3s, and Pulse Width = 33%). If the input is set to shorter $T_{off}$, the signals alternate between the two output channels, for instance $T_{on}=1$s, and $T_{off}=0.25$s (In Simulink: ‘stimulus’ Period = 1.25s, and Pulse Width = 80%).