$$weight_k = w_k \sim Dir(\vec{\alpha_0}) \tag{1}$$

$$phaseweight_k = \bar{w}_k \sim Dir(\vec{w}^T \vec{\alpha_1}) \tag{2}$$

$$locs_k = c_k \sim N(\vec{0}, \vec{I}) \tag{3}$$

$$scale_d = s_d \sim U(\gamma/2, 3\gamma/2) \tag{4}$$

$$obs_i = y_i = N(\vec{\bar{w}}^T \vec{c}, \Sigma) \tag{5}$$