$$\vec{x}[t+1] = \lambda \vec{x}[t] + u[t]$$

$$u[t] = -\alpha \left(d^T[t]\, x[t] \right) d[t]$$

$$(\lambda - \alpha \gamma_1)(\lambda - \alpha\beta_1)\, v_1 v_1^T + \sum_{i=2}^{N} \alpha^2 \beta_i^2 \gamma_i^2 v_i v_i^T$$

$$+ \alpha^2 \sum_{i \neq j} \beta \; v_i v_j^T$$

$$v_i v_k^T v_k v_j$$

$$\beta_i \beta_k \gamma_k \gamma_j$$

$$\beta_i \left(\sum \beta_k \gamma_k\right) \gamma_j$$

$) + 4X_2$

$$x[t+1] = \lambda (v^T x[t]) v + u[t]$$

$$u[t] = -\alpha (d^T[t]\, x[t])\, d[t]$$

$$x[t+1] = \lambda(v^T x[t])\, v - (\alpha\, d^T[t]\, x[t])\, d[t]$$

$$(\lambda v v^T - \alpha d_t d_t^T)\, x[t]$$

$$\lambda \vec{v}(\vec{v}^T \vec{x}[t]) - \alpha\, d[t]\, d^T[t]\, \vec{x}[t]$$

$$\lambda_1 \vec{v}_1 \vec{v}_1^T - \alpha\left(\sum \beta_i v_i\right)\left(\sum \beta_i v_i^T\right)$$

$$\lambda \vec{v}_1 \vec{v}_1^T - \alpha\beta_1^2 \vec{v}_1 \vec{v}_1^T + \dots$$

$$\boxed{= (\lambda - \alpha\beta_1^2)\, \vec{v}_1 \vec{v}_1^T + \alpha \sum_{i \neq j} \beta_i \beta_j v_i v_j^T + \sum_{i=2}^{n} \alpha \beta_i^2 \vec{v}_i \vec{v}_i^T}$$

v_i

$\beta_i^2 \sim \frac{1}{N}$ $\quad \alpha \leq N$ (average)