m

$$\int d_i^m(\tau - t) d_j^m(\tau) d\tau$$

$$\int d_i^m(\tau) d_j^m(\tau + t) d\tau$$

$$d_i^m(t) \star d_j^m(t)$$

$$d_i^m(-t) * d_j^m(t).$$

$w_i(t)$

$$\int r^m(t-\tau)w_i(\tau)d\tau + n_i^m(t)$$

$$r^m(t) * w_i(t) + n_i^m(t).$$

$$r^m(t) \star r^m(t) = R^m \delta(t),$$

R^m

$\delta(t)$

$n_i^m(t) \star n_i^m(t)$

$N(t).$

$0,\ \forall i \neq j.$

$0,\ \forall i.$

$n_i^m(t) \star w_j(t)$

$0,\ \forall i, j.$

$$[r^m(t) * w_i(t) + n_i^m(t)] \star [r^m(t) * w_j(t) + n_j^m(t)]$$

$$[r^m(-t) * w_i(-t) + n_i^m(-t)] * [r^m(t) * w_j(t) + n_j^m(t)]$$

$$[r^m(-t) * w_i(-t) * r^m(t) * w_j(t)] + [n_i^m(-t) * n_j^m(t)]$$

$$[r^m(t) \star r^m(t)] * [w_i(t) \star w_j(t)] + [n_i^m(t) \star n_j^m(t)]$$

$$R^m[w_i(t) \star w_j(t)] + \delta_{i-j} N(t).$$

δ_{i-j}

$$\min_{w_i(t),R^m} \sum_{\{m,i,j\}} \int \{c_{ij}^m(t) - R^m[w_i(t) \star w_j(t)]\}^2 dt + \epsilon \sum_i \int [w_i(t)]^2 dt.$$

ϵ

$$R^m[w_i(t) + \Delta w_i(t)] \star [w_j(t) + \Delta w_j(t)]$$

$$R^m[w_i(t) \star w_j(t)]$$

$$R^m[w_i(t) \star \Delta w_j(t) + \Delta w_i(t) \star w_j(t)].$$