

$$F_{\ell\ell'L'}^{s_x} \stackrel{\text{def}}{=} [-\ell(\ell+1) + \ell'(\ell'+1) + L'(L'+1)] \sqrt{\frac{(2\ell+1)(2\ell'+1)(2L'+1)}{16\pi}} \begin{pmatrix} \ell & \ell' & L' \\ -s_x & s_x & 0 \end{pmatrix} \quad (1)$$

$$\Theta(\hat{\mathbf{n}}), Q(\hat{\mathbf{n}}), U(\hat{\mathbf{n}}) \quad (2)$$

$$Q \pm iU \rightarrow e^{\pm 2i\theta} (Q \pm iU) \quad (3)$$

$$\Theta \rightarrow \Theta \quad (4)$$

$$\Theta(\hat{n}) = \sum_{\ell m} \Theta_{\ell}^m Y_{\ell}^m(\hat{n}) \quad (5)$$

$$Q \pm iU \rightarrow e^{\pm 2i\theta} (Q \pm iU) \quad (6)$$

$$(Q \pm iU)(\hat{n}) = - \sum_{\ell m} (E_{\ell}^m \pm iB_{\ell}^m)_2 Y_{\ell}^m(\hat{n}) \quad (7)$$

$$\left\langle a_l^m b_{l'}^{m'} \right\rangle = C_l^{ab} \delta_{ll'} \delta_{m-m'} (-1)^m \quad (8)$$

$$\phi(\hat{n}) = \sum_{\ell m} \phi_{\ell}^m Y_{\ell}^m(\hat{n}) \quad (9)$$

$$\langle a\left(\mathbf{l}_1\right)b\left(\mathbf{l}_2\right)\rangle=(2\pi)^2\delta^2\left(\mathbf{l}_1+\mathbf{l}_2\right)C_{\ell}^{ab} \quad (10)$$

$$\langle a\left(\mathbf{l}_1\right)b\left(\mathbf{l}_2\right)\rangle|_{lens}=(2\pi)^2\delta^2\left(\mathbf{l}_1+\mathbf{l}_2\right)C_{\ell}^{ab}+\phi_{\mathbf{L}}f\left(\ell_1,\ell_2\right) \quad (11)$$

$$\left\langle a_l^m b_{l'}^{m'} \right\rangle = C_l^{ab} \delta_{ll'} \delta_{m-m'} (-1)^m \quad (12)$$

$$\left\langle a_l^m b_{l'}^{m'} \right\rangle \Big|_{\text{lens}} = C_l^{ab} \delta_{ll'} \delta_{m-m'} (-1)^m + \sum_{LM} (-1)^M \begin{pmatrix} l & l' & L \\ m & m' & -M \end{pmatrix} f_{lLl'}^{\alpha} \phi_L^M \quad (13)$$

$$\phi(\mathbf{l}) \tag{14}$$

$$\langle d_L^{\alpha M}\rangle_{CMB}=\sqrt{L(L+1)}\phi_L^M \tag{15}$$

$$d_{\theta\theta}(\mathbf{L})=\frac{A_{\theta\theta}(L)}{L}\int\frac{d^2l_1}{(2\pi)^2}\Theta\left(\mathbf{l}_1\right)\Theta'\left(\mathbf{l}_2\right)F_{\theta\theta}\left(1_1,1_2\right) \tag{16}$$

$$d_{\alpha}(\mathbf{L})=\frac{A_{\alpha}(L)}{L}\int\frac{d^2l_1}{(2\pi)^2}a\left(\mathbf{l}_1\right)b\left(\mathbf{l}_2\right)F_{\alpha}\left(1_1,1_2\right) \tag{17}$$

$$\Theta = \Theta_p + \Theta^{kSZ} \tag{18}$$

$$\langle \theta \theta \rangle \tag{19}$$

$$l_{max}$$

$$\Theta(\hat{n})$$

$$Q(\hat{n})$$

$$U(\hat{n})$$

$$\Theta(\mathbf{l})~E(\mathbf{l})~B(\mathbf{l})$$

$$\Theta_l^m~E_l^m~B_l^m$$