Miscellaneous formulas

$$\varphi_a(\boldsymbol{r}) = \bar{N}_a^{-1/2}\chi(\boldsymbol{r} \in V_a) \tag{1}$$

$$x_a = \int d^3r\ \varphi_a(\boldsymbol{r})[n(\boldsymbol{r}) - \bar{n}(\boldsymbol{r})] = \bar{N}_a^{-1/2}(N_a - \bar{N}_a) \tag{2}$$

$$\langle x_a \rangle = 0 \tag{3}$$

$$\langle x_a x_b \rangle = C_{ab} = S_{ab} + N_{ab} \tag{4}$$

$$N_{ab} = \delta_{ab} \tag{5}$$

$$S_{ab} = \int d^3r_1\ d^3r_2\ \bar{n}(\boldsymbol{r}_1)\bar{n}(\boldsymbol{r}_2)\varphi_a(\boldsymbol{r}_1)\varphi_b(\boldsymbol{r}_2)\xi(\boldsymbol{r}_1,\boldsymbol{r}_2) = \bar{N}_a^{1/2}\bar{N}_b^{1/2}\int_{V_a}\frac{d^3r_1}{V_a}\int_{V_b}\frac{d^3r_2}{V_b}\ \xi(\boldsymbol{r}_1,\boldsymbol{r}_2) \tag{6}$$

$$y_i = \sum_a B_{ia}x_a \tag{7}$$

$$\langle y_i \rangle = 0 \tag{8}$$

$$\langle y_i y_j \rangle = C_{ij} = \delta_{ij}(1 + \lambda_i) \tag{9}$$

$$\tag{10}$$