

$$\delta(\mathbf{k}, \tau) = \sum_{n=1}^{\infty} a^n(\tau) \int \frac{d^3 q_1}{(2\pi)^3} \cdots \frac{d^3 q_{n-1}}{(2\pi)^3} \int d^3 q_n \delta_D\left(\sum_{i=1}^n \mathbf{q}_i - \mathbf{k}\right) F_n(\mathbf{q}_1, \mathbf{q}_2, \cdots, \mathbf{q}_n) \delta_1(\mathbf{q}_1) \cdots \delta_1(\mathbf{q}_n),$$

$$\theta(\mathbf{k}, \tau) = - \sum_{n=1}^{\infty} \dot{a}(\tau) a^{n-1}(\tau) \int \frac{d^3 q_1}{(2\pi)^3} \cdots \frac{d^3 q_{n-1}}{(2\pi)^3} \int d^3 q_n \delta_D\left(\sum_{i=1}^n \mathbf{q}_i - \mathbf{k}\right) G_n(\mathbf{q}_1, \mathbf{q}_2, \cdots, \mathbf{q}_n) \delta_1(\mathbf{q}_1) \cdots \delta_1(\mathbf{q}_n)$$