Normal-ordered operators:

$$E_0 = \sum_i n_i t_{ii} + \frac{1}{2} \sum_{ij} n_i n_j V_{ijij} + \frac{1}{6} n_i n_j n_k V^{(3)}_{ijkijk} \tag{1}$$

$$f_{pq} = t_{pq} + \sum_i n_i V_{piqi} + \frac{1}{2} \sum_{ij} n_i n_j V^{(3)}_{pijqij} \tag{2}$$

$$\Gamma_{pqrs} = V_{pqrs} + \sum_i n_i V^{(3)}_{pqirsi} \tag{3}$$

$$W_{pqrstu} = V^{(3)}_{pqrstu} \tag{4}$$

IMSRG flow equations:

$$\frac{d}{ds} E_0 = \sum_{ab} n_a \bar{n}_b \left(\eta_{ab} f_{ba} - f_{ab} \eta_{ba} \right) + \frac{1}{4} \sum_{abcd} n_a n_b \bar{n}_c \bar{n}_d \left(\eta_{abcd} \Gamma_{cdab} - \Gamma_{abcd} \eta_{cdab} \right) \tag{5}$$

$$\frac{d}{ds} f_{ij} = \sum_a \left(\eta_{ia} f_{aj} - f_{ia} \eta_{aj} \right) + \sum_{ab} (n_a \bar{n}_b - \bar{n}_a n_b) \left(\eta_{ab} \Gamma_{biaj} - f_{ab} \eta_{biaj} \right)$$
$$+ \frac{1}{2} \sum_{abc} (n_a n_b \bar{n}_c + \bar{n}_a \bar{n}_b n_c) \left(\eta_{ciab} \Gamma_{abcj} - \Gamma_{ciab} \eta_{abcj} \right) \tag{6}$$

$$\frac{d}{ds} \Gamma_{ijkl} = \sum_a \left[(1 - P_{ij} \left(\eta_{ia} \Gamma_{ajkl} - f_{ia} \eta_{ajkl} \right) - (1 - P_{kl}) \left(\eta_{ak} \Gamma_{kjal} - f_{ak} \eta_{ijal} \right) \right]$$
$$+ \frac{1}{2} \sum_{ab} (\bar{n}_a \bar{n}_b - n_a n_b) \left(\eta_{ijab} \Gamma_{abkl} - \Gamma_{ijab} \eta_{abkl} \right)$$
$$+ (1 - P_{ij})(1 - P_{kl}) \sum_{ab} (n_a \bar{n}_b - \bar{n}_a n_b) \eta_{aibk} \Gamma_{bjal} \tag{7}$$

The White generator:

$$\eta^{\mathrm{Wh}}_{ai} = \frac{f_{ai}}{\Delta_{ai}} \tag{8}$$

$$\eta^{\mathrm{Wh}}_{abij} = \frac{\Gamma_{abij}}{\Delta_{abij}} \tag{9}$$

Energy denominators:

$$\Delta_{ai} = f_{aa} - f_{ii} \tag{10}$$

$$\Delta_{abij} = f_{aa} + f_{bb} - f_{ii} - f_{jj} \tag{11}$$

Simplification of flow equation for nuclear matter:

$$\frac{d}{ds}E_0 = \frac{1}{4}\sum_{abcd} n_a n_b \bar{n}_c \bar{n}_d \left(\eta_{abcd}\Gamma_{cdab} - \Gamma_{abcd}\eta_{cdab}\right) \tag{12}$$

$$\frac{d}{ds}f_{ij} = \frac{1}{2}\sum_{abc}(n_a n_b \bar{n}_c + \bar{n}_a \bar{n}_b n_c)\left(\eta_{ciab}\Gamma_{abcj} - \Gamma_{ciab}\eta_{abcj}\right) \tag{13}$$

$$\frac{d}{ds}\Gamma_{ijkl} = (A_{ii} + A_{jj} - A_{kk} - A_{ll})B_{ijkl} - (B_{ii} + B_{jj} - B_{kk} - B_{ll})A_{ijkl}$$
$$+ \frac{1}{2}\sum_{ab}(\bar{n}_a \bar{n}_b - n_a n_b)\left(\eta_{ijab}\Gamma_{abkl} - \Gamma_{ijab}\eta_{abkl}\right) \tag{14}$$
$$+ (1 - P_{ij})(1 - P_{kl})\sum_{ab}(n_a \bar{n}_b - \bar{n}_a n_b)\eta_{aibk}\Gamma_{bjal}$$