

LES_LBM

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Contents

(R(T 速度空間離散化波茲曼方程) 的 (濾波形式)) = (U 濾波型速度空間離散化波茲曼方程)

$$\begin{aligned} \overline{\frac{\partial f_\alpha}{\partial t}} + \overline{e_{i\alpha} \cdot \frac{\partial f_\alpha}{\partial x_i}} &= \overline{\Omega_\alpha(f_\alpha)} \\ \leftrightarrow \overline{\frac{\partial f_\alpha}{\partial t}} + e_{i\alpha} \cdot \overline{\frac{\partial f_\alpha}{\partial x_i}} &= \overline{\Omega_\alpha(f_\alpha)} \end{aligned} \quad (\text{零.1})$$

(U(E 晶格波茲曼方程) 的 (濾波形式)) = (A 濾波型晶格波茲曼方程)

$$\begin{aligned} \overline{f_\alpha(\vec{r} + \vec{e}_\alpha \delta t, t + \delta t)} &= \overline{f_\alpha(\vec{r}, t)} + \overline{\Omega_\alpha(f_\alpha)} \\ \overline{f_\alpha(\vec{r} + \vec{e}_\alpha \delta t, t + \delta t)} &= \overline{f_\alpha(\vec{r}, t)} + \overline{\Omega_\alpha(f_\alpha)} \end{aligned} \quad (\text{零.2})$$

因為“速度空間離散化波茲曼方程”與“晶格波茲曼方程”皆為線性方程，所以先做濾波，跟先做離散化，順序可以對調，最後均得到濾波型晶格波曼方程。