

$$\begin{aligned}
 |\mathbf{I} + \epsilon \mathbf{M}| = & \begin{vmatrix}
 1 + \epsilon M_{11} & \epsilon M_{12} & \epsilon M_{13} & \epsilon M_{14} & \epsilon M_{15} \\
 \epsilon M_{21} & 1 + \epsilon M_{22} & \epsilon M_{23} & \epsilon M_{24} & \epsilon M_{25} \\
 \epsilon M_{31} & \epsilon M_{32} & 1 + \epsilon M_{33} & \epsilon M_{34} & \epsilon M_{35} \\
 \epsilon M_{41} & \epsilon M_{42} & \epsilon M_{43} & 1 + \epsilon M_{44} & \epsilon M_{45} \\
 \epsilon M_{51} & \epsilon M_{52} & \epsilon M_{53} & \epsilon M_{54} & 1 + \epsilon M_{55}
 \end{vmatrix} \\
 = & (1 + \epsilon M_{11}) (1 + \epsilon M_{22}) C'_{22} + O(\epsilon^2)
 \end{aligned}$$