$$u_0' \longrightarrow \begin{bmatrix} \partial_t u' - L u' = 0 \\ \text{integrate forwards} \end{bmatrix} \mathcal{M}^* \mathcal{M} u_0' = u_0^* \longleftarrow \begin{bmatrix} \partial_t u^* + L^* u^* = 0 \\ \text{integrate backwards} \end{bmatrix} \leftarrow$$

$$- \frac{\partial_t \boldsymbol{u}^* + L^* \boldsymbol{u}^* = 0}{\text{integrate backwards}} \leftarrow$$