Betrachten wir den GDF zur Endzeit $T=t_N$:

$$|\epsilon_N| \overset{\text{Def.}}{=} |y(t_N) - y_N|$$

$$= \Big| y(t_{N-1}) + h\cdot \frac{y(t_N)-y(t_{N-1})}{h} \quad \text{+ 0 Trick}$$

$$\text{+ 0 Trick}$$

$$- h\big(\phi(t_{N-1},y(t_{N-1}),h) - \phi(t_{N-1},y(t_{N-1}),h)\big)$$

$$- \underbrace{\big(y_{N-1} + h\cdot \phi(t_{N-1},y_{N-1},h)\big)}_{y_N} \Big|$$

$$\overset{\Delta\text{-Ug}}{\leq} |y(t_{N-1}) - y_{N-1}| = \epsilon_{N-1}$$

$$+ h\cdot \left| \frac{y(t_N)-y(t_{N-1})}{h} - \phi(t_{N-1},y(t_{N-1}),h) \right| = h\cdot\tau_N = e_N$$

$$+ h\cdot \big|\phi(t_{N-1},y(t_{N-1}),h) - \phi(t_{N-1},y_{N-1},h)\big|$$

$$\leq h\tilde{L}\,|y(t_{N-1}) - y_{N-1}| = h\tilde{L}\,|\epsilon_{N-1}|$$

$$= (1+h\tilde{L})|\epsilon_{N-1}| + |e_N|$$

Rekursiv einsetzen $= (1+h\tilde{L})\Big(\overbrace{(1+h\tilde{L})|\epsilon_{N-2}| + |e_{N-1}|}\Big) + |e_N|$

$$\vdots$$

$$= (1+\tilde{L}h)^N|\epsilon_0| + \sum_{j=1}^{N} \underbrace{(1+h\tilde{L})^{N-j}}_{\leq (1+h\tilde{L})^N} |e_j|$$