

$$\begin{aligned} \frac{1}{2}d(x_{k+1}, \mathcal{X}_{\hat{f}_{k+1}}^*)^2 &\leq \frac{(1-\alpha\mu')^k}{\mu f} \frac{(\textcolor{blue}{L}_f)d(x_0, \mathcal{X}_{f_0}^*)^2 - \eta^* - \eta_0}{\mu f} \\ &\quad + \frac{\alpha}{c\mu_f} \sum_{t=0}^k (1-\alpha\mu')^{k-t} \hat{f}_k^* + \frac{\eta^* + \eta_0}{\mu f \mu' \alpha}. \end{aligned}$$