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## I. ANALYSIS

$$\begin{aligned} \|W_{t,i} - W^*\| &= \|W_{t,i} - W_t + W_t - W^*\| \\ &\leq \|W_{t,i} - W_t\| + \|W_t - W^*\| \quad (1) \\ &\leq \|W_{t,i} - W_t\| + \rho \end{aligned}$$

$$\|W_{t,i} - W_t\|_1 = \left\| \sum_{j \in N} \frac{|D_j| \hat{W}_{t,i}}{|D|} - W^* \right\|_1 \quad (2)$$

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