

Time step increment

$$\hat{x}_{n+1} \leftarrow \hat{x}_n$$

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Calculate predictions from values of former steps as

$$\hat{x}_{n+1} = \hat{x}_n + \frac{\Delta t}{2} \hat{x}_n$$

$$\hat{x}_{n+1} = \hat{x}_n + \Delta t \hat{x}_n + \frac{\Delta t^2}{2} \hat{x}_n$$

Calculate $R\hat{x}_{n+1}$ everywhere in cascade region

$$R\hat{x}_{n+1} = F_{n+1} - R\hat{x}_n$$

obtain \hat{x}_{n+1} by multiplying as defined in

$$\hat{x}_{n+1} = R\hat{x}_{n+1} \cdot \Delta t^{-1}$$