Invertible NN

 $egin{aligned} \mathbf{v}_k' = egin{aligned} \mathbf{\Gamma}^{\pm}(\mathbf{v}_k; \zeta_{\mathbf{v}_k}) \end{aligned}$ 

1. Half-step full v update:

2. Full-step **half** x update:  $\mathbf{x}_k' = m^k \odot \mathbf{x}_k + \overline{m}^k \odot \overline{\Lambda}^{\pm} \left[ \overline{\mathbf{x}}_k; \zeta_{\overline{\mathbf{x}}_k} \right]$ 

3. Full-step **half** x update:  $\mathbf{x}''_{l} = \mathbf{\bar{m}}^{k} \odot \mathbf{\bar{x}}'_{l} + m^{k} \odot \mathbf{\Lambda}^{\pm} [\mathbf{x}'_{l} : \zeta_{\mathbf{x}'}]$ 

 $\mathbf{x}_k'' = ar{m{m}}^k \odot ar{\mathbf{x}}_k' + m{m}^k \odot ar{f \Lambda}^{\pm} \left[ \mathbf{x}_k'; \zeta_{\mathbf{x}_k'} 
ight]$ 

4. Half-step full v update:  $\mathbf{v}_k'' = \frac{\Gamma^{\pm}(\mathbf{v}_k'; \zeta_{\mathbf{v}_k})}{\Gamma^{\pm}(\mathbf{v}_k'; \zeta_{\mathbf{v}_k})}$