

$$\begin{array}{ccc}
 T_p\mathcal{M} \times T_p\mathcal{M} & \xrightarrow{(\omega_{\mathcal{M}})_p} & \mathbb{R} \\
 \downarrow dF_p \times dF_p & \nearrow (\omega_{\mathcal{N}})_p & \\
 T_{F(p)}\mathcal{N} \times T_{F(p)}\mathcal{N} & &
 \end{array}$$