

$$\begin{aligned}
 \omega_0(X, Y) &= (J_0 X) \cdot Y && X, Y \text{ columns} \\
 &= (J_0 X)^T Y \\
 &= X^T J_0^T Y \\
 &= X^T (-J_0) Y
 \end{aligned}$$

$$X, Y \in \mathfrak{X}(M), \omega$$

$$\omega(X, Y): M \longrightarrow \mathbb{R}$$

$$p \longmapsto \omega_p(X_p, Y_p)$$

$$\begin{aligned}
 \varphi^* \omega(\cdot, \cdot) &= \omega(d\varphi(\cdot), d\varphi(\cdot)) \\
 &= \omega(\varphi_* (\cdot), \varphi_* (\cdot))
 \end{aligned}$$

$$= \omega \leftarrow \text{Symp}(M, \omega)$$

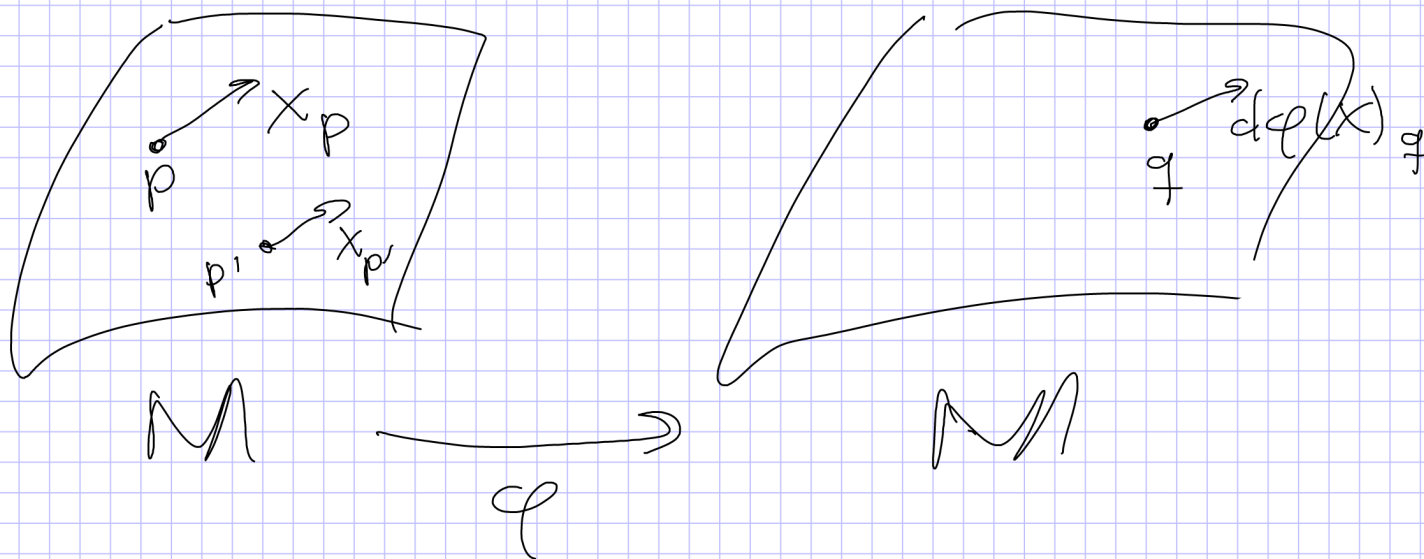
$$\varphi: M \longrightarrow M \quad \text{surve}$$

$$X \in \mathfrak{X}(M)$$

$$d\varphi(X) \in \mathfrak{X}(M)$$

$$p \longmapsto d\varphi_p(X_p) \in T_{\varphi(p)} M$$

$$\begin{array}{ccccc}
 M & \xrightarrow{\varphi} & M & \xrightarrow{d\varphi_p} & T_{\varphi(p)}M \\
 p \downarrow & & & & \downarrow \\
 & & & & d\varphi_p(X_p)
 \end{array}$$



$$p \ni \varphi(p) = q \quad \therefore \quad d\varphi(X)_q = d\varphi_p(X_p)$$

Problemas:

$$\varphi^{-1}(q) = \emptyset$$

$$|\varphi^{-1}(q)| > 1$$

puede ocurrir si φ no es sobre
puede ocurrir si φ no es 1-1.

X campo

φ_t flujo

Y otro campo

