only if there exist a faithfully flat $A \to A'$ s.t. $B' = \prod A'$ (fin. prod.). //

Thm The rel. Frob. is an iso. for the following map of stacks over $\mathbb{Z}/p$.

$$\mathcal{A} = (\mathcal{M}_{Ell})^{\wedge}_{ss} \quad \text{— completion at supersing. locus}$$

$$\downarrow$$

$$\mathcal{B} = (\mathcal{M}_{FG})^{\wedge}_{h=0} \quad \text{— completion at ``height = 2 locus''}$$

pf let R be a local $\mathbb{Z}/p$-alg. with nilp. max'l ideal m. To give a map $\operatorname{Spec} R \to \mathcal{A}$ corresponds to an elliptic curve $\mathcal{C}$ over R s.t. $\mathcal{C}/m$ is super-sing. Similarly, $\operatorname{Spec} R \to \mathcal{B}$ corresponds to a f. grp. G over R s.t. G/m is height 2.

$$\begin{tikzcd}
\mathcal{A} \arrow[dr, "\text{iso?}"] \arrow[drr, bend left, "\varphi"] \arrow[ddr, bend right] & & \\
& \mathcal{P} \arrow[r] \arrow[d] & \mathcal{A} \arrow[d] \\
& \mathcal{B} \arrow[r, "\varphi"] & \mathcal{B}
\end{tikzcd}$$

A map $\operatorname{Spec} R \to \mathcal{B}$ corresponds to an ell. curve J and a ∞ formal grp G as above together with an iso. $G^\varphi \approx \hat{J}$. If $\operatorname{Spec} R \to \mathcal{A}$ corresp. to the ell. curve C, then the comp. w. $\mathcal{A} \to \mathcal{B}$ corresponds to $J = C^\varphi$, $G = \hat{C}$. We must show that given $(J, G, G^\varphi \approx \hat{J})$, there exists C s.t. $C^\varphi = J$, $\hat{C} = G$. Now

Super-singular: An elliptic curve J over a field is super-singular if and only if

$$\left\{\begin{matrix} p\text{-subgrps.} \\ \text{of } \hat{J} \end{matrix}\right\} \xrightarrow{\sim} \left\{\begin{matrix} p\text{-subgrps.} \\ \text{of } J \end{matrix}\right\}$$

$$\begin{tikzcd} J \arrow[r] \arrow[dr, "p"'] & J^\varphi \arrow[d] \\ & J \end{tikzcd} \qquad \begin{tikzcd} & K = \text{kernel} \arrow[d] \\ G \arrow[r] \arrow[dr, "p"'] & G^\varphi \arrow[d] \\ & G \end{tikzcd}$$

$\hat{J} = G^\varphi$, $K \subset J$; define $C = J/K$