on upslope side of ridge, $\frac{\partial h_s}{\partial x} > 0$

if $F_r < 1 \Rightarrow \frac{dU}{\partial x} > 0$ subcritical on windward side → flow will accelerate

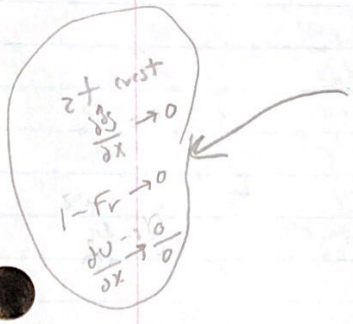
if $F_r > 1 \Rightarrow \frac{dU}{\partial x} < 0$ supercritical flow on windward side → flow will decelerate

Consider $F_r < 1$ on windward side

U increases up mtn. $\}$ $\Rightarrow F_r = \frac{U^2}{C^2}$ increases

$c = \sqrt{g(h - h_s)}$ up mtn. $\}$

($h - h_s$ decreases)

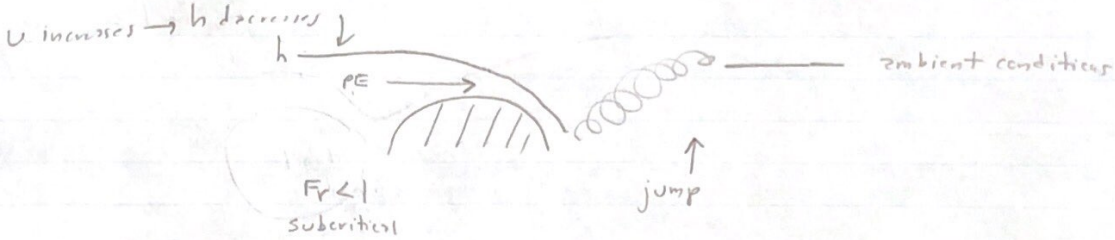
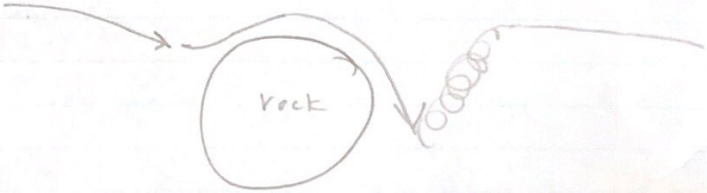


if $F_r \to 1$ at crest, then since $\frac{dU}{\partial x} = \frac{U \frac{g}{C^2} \frac{\partial h_s}{\partial x}}{1 - F_r} \to$ vy large ($\frac{\partial h_s}{\partial x} > 0$) $\Rightarrow$ U becomes vy large

$\Rightarrow F_r > 1$ becomes supercritical & continues to accelerate on lee side ($\frac{\partial h_s}{\partial x} < 0$, $1 - F_r < 0$)

in a turbulent "hydraulic jump"

PE → KE whole way!



like rock in stream