



$$\hat{u} = u - \beta x$$

$$x = A \hat{u} = A(u - \beta x)$$

$$x = A(u - \beta x)$$

$$\Rightarrow x(1 + A\beta) = Au$$

$$\Rightarrow x = \frac{A}{1 + \beta A} u$$

Want:  $\frac{A}{1 + \beta A} = 10^3$

$$A = 10^6 \leftrightarrow 10^{17}$$

$$\frac{10^7}{1 + \beta 10^7} \approx \frac{10^6}{10^3} = 10^3$$

$\downarrow$   
 $10^{-2}$   
 $\underbrace{\hspace{2em}}_{10^3}$