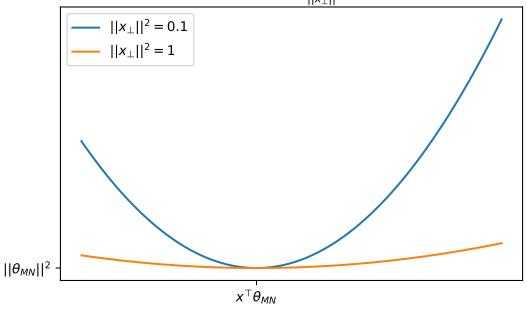$$||\theta_{N+1}||^2 = ||\theta_{MN}||^2 + \frac{1}{||x_\perp||^2}(y - x^\top \theta_{MN})^2$$