Entanglement entropy in a boundary impurity model GREGORY LEVINE, Hofstra University — Boundary impurities are known to dramatically alter certain bulk properties of 1 + 1 dimensional strongly correlated systems. The entanglement entropy of a zero temperature Luttinger liquid bisected by a single impurity is computed using a novel finite size scaling/bosonization scheme. For a Luttinger liquid of length $2L$ and UV cut off $\epsilon$, the boundary impurity correction ($\delta S_{\text{imp}}$) to the logarithmic entanglement entropy ($S_{\text{ent}} \propto \ln L/\epsilon$) scales as $\delta S_{\text{imp}} \sim y_r \ln L/\epsilon$, where $y_r$ is the renormalized backscattering coupling constant. In this way, the entanglement entropy within a region is related to scattering through the region’s boundary. In the repulsive case ($g < 1$), $\delta S_{\text{imp}}$ diverges (negatively) suggesting that the entropy vanishes. Our results are consistent with the recent conjecture that entanglement entropy decreases irreversibly along renormalization group flow.