CO₂ sequestration via pressure driven displacement experiments on fluid-gas plugs in a capillary tube SRAVYA SASETTY, THOMAS WARD, Iowa State University — This talk focuses on experiments conducted to further our understanding on the feasibility of carbon sequestration using a chemical reaction between CO₂ gas and aqueous Ca(OH)₂ which produces CaCO₃ precipitates. Experiments were performed in a capillary tube (dia ≈ 800 μm) by displacing liquid plugs of different volumes containing Ca(OH)₂ (0 ≤ c ≤ 20 mol m⁻³) dissolved in aqueous glycerol solution using CO₂ gas at pressures 0.2 psig ≤ P ≤ 1.0 psig. A CCD camera captured the displaced and displacing fluid interfaces and an in-house MATLAB code was used to measure both the mean $U_m$ and tip $U_t$ velocities. Subsequently, we measure the film thickness using the expression $m = 1 - U_m/U_t$ where $m$ is a measure of displaced fluid still remaining inside the tube. Surface tension values obtained using an in-house pendant drop tensiometer were used to calculate the capillary number $Ca$. We report the $m$ versus $Ca$ trends observed in our experiments and compare them against immiscible fluid displacement classical results.