Submillimeter/Infrared Double Resonance is a well-established technique. It has been used for spectroscopy, studies of collisional energy transfer, and diagnostics. The high level of molecule specific spectroscopic specificity achieved through this technique makes it an attractive candidate for sensor application. Here we will discuss its application to sensor development, with emphasis on regimes of applicability that range from mTorr to atmospheric pressure. System requirements and development as well as theoretical and experimental results will be discussed.