Research is carried out aiming at assimilating cloudy hyperspectral infrared radiances, thereby extending the sounding down to the uppermost cloud layer. 1D-Var assimilation tests are made with real AIRS data combined with a NWP first guess. The pre-processing defines two cloud parameters: cloud top height and cloud fraction from a scheme using CO$_2$ slicing estimates of these parameters as a first guess. Currently, only temperature sounding channels in the 13.5-15.5 micron part of the spectrum are used so that the assumption of a constant cloud emissivity remains reasonable. This initial study aims at identifying most favorable situations for a successful assimilation and positive impact.