LIQUID PHASE SUPERCONTINUUM FIBER-LOOP CAVITY ENHANCED ABSORPTION SPECTROSCOPY FOR H_2O IN ORGANICS

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Last year we presented a way of liquid phase sensing for H_2O and D_2O samples using a side-polished-fiber (SPF) sensor. It is a setup to combine the advantages of Supercontinuum light source with fiber-loop sensing method to make liquid phase CEAS sensing easier and more reliable. After some calculation we found out that with a SPF sensor we could only make use of less than 0.2% of the light from Supercontinuum source, so we decided to make changes on sensors in order to make more light usable. Instead of a SPF or similar evanescent wave sensors, if the light can be guided through a sample directly in free space, we can get almost 100% of the light to be used. So we replaced our sensor by using a mirror and two fibers placed vertical to it side-by-side. The mirror reflects light from one fiber to the other. The free space coupling can make the most of our Supercontinuum source, and a much stronger signal is observed so far. We are now able to use our setup to monitor very low H_2O concentrations such as saturated H_2O solution in organics like CCl_4. Hopefully we can make our system more reliable in the future to make it use in more samples and lower concentrations.