

# **Nanoplasmonics and surface enhanced spectroscopy**

## **Light-induced resonant heating and vapour generation by water-immersed gold nanoparticles**

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The absorption of light by gold nanoparticles in colloidal water solution at the simultaneous excitation of nanoparticles by the continuous-wave laser beam was studied in dependence of the detuning of laser frequency from the surface plasmon resonance. The appreciable blue shift, broadening and increase of intensity of the plasmonic absorption band were observed at approaching of the laser frequency to surface plasmon resonance in Au nanoparticles. The plasmon band broadening is an evidence of laser induced heating of the gold nanoparticles that has an apparent resonant character. The maximal increase in temperature was estimated as 316 K. The sharp blue shift of plasmon band was observed when the temperature exceeded the water boiling point. Such effect is due to formation of the vapor bubbles around the Au nanoparticles occurring at water boiling.