

# MODULAR CHEMICAL SENSOR TECHNOLOGIES FOR ENVIRONMENTAL MONITORING

F.K.Tittel<sup>1</sup>, R.Lewicki<sup>1</sup>, M.Jahjah<sup>1</sup>, Y.F.Ma<sup>1</sup>, J.Waclawek<sup>2</sup>, E.t.H.Chrysostom<sup>2</sup>, B.Lendl<sup>2</sup>, Y.Zhang<sup>3</sup>

<sup>1</sup>*Rice University, Houston, TX. USA*

<sup>2</sup>*Vienna University of technology, Vienna, Austria*

<sup>3</sup>*Scinovation, Inc., Princeton, NJ. USA*

A 5.26  $\mu\text{m}$  and 7.24  $\mu\text{m}$  CW TEC HHL packaged DFB-QCL based quartz enhanced photoacoustic spectroscopy (QEPAS) sensor for NO and SO<sub>2</sub> detection was demonstrated. A  $1\sigma$  minimum detection limit of 3 ppb and 33 ppb was achieved for a sampling time of 1 sec. using interference free NO and SO<sub>2</sub> absorption lines located at 1900.08  $\text{cm}^{-1}$  and 1380.94  $\text{cm}^{-1}$  respectively.