Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

Stimulated emission following excitation of the Xe 6p' and Xe 7p states[1] VADIM ALEKSEEV, Institute of Physics, St. Petersburg State University, Russia, PETER VAN DER BURGT, Department of Experimental Physics, National University of Ireland, Ireland, JOHN MCCAFFREY, Department of Chemistry, National University of Ireland, Ireland, DONALD SETSER, Department of Chemistry, Kansas State University, USA — Stimulated emission (SE) in Xe gas induced by two-photon excitation of np and nf resonances has been studied earlier [1-3]. Excitation of the high-lying 6p' and 7p states results in SE on 6p → 6s transitions, which implies the cascading radiative effect in the IR region involving the 7s or 5d states as intermediate states. In this contribution we report on studies of the SE effect in the 1-5 μm region following excitation of the Xe 6p'$[1/2]_0$, 6p' $[3/2]_2$, 7p$[1/2]_0$, 7p$[3/2]_2$ and 7p$[5/2]_2$ states. We found that for both 6p' states the SE spectrum displays intense radiative cascade via 5d$[1/2]_1$ and 6p$[1/2]_1$ states, 6p' → 5d$[1/2]_1$ → 6p$[1/2]_1$ → 6s$[3/2]_2$, while cascading via the 7s states is less efficient and may be observed only at optimized Xe pressure and laser power. In contrast, excitation of the 7p states results in cascading SE via the 7s states and transitions to the 5d states are not seen under conditions of our experiment. [1] J.C. Miller, Phys.Rev.A 40(1989)6969 [2] V.A. Alekseev, D.W. Setser, J.Chem.Phys. 105(1996) 4613 [3] V.A. Alekseev, D.W. Setser, J.Phys.Chem. A 103(1999)8396

[1]VA acknowledges support from Science Foundation of Ireland via a Walton visitor award.

Vadim Alekseev
Institute of Physics, St. Petersburg State University,
Ul'janovskaja St.1, Peterhof, 198504 St. Petersburg, Russia

Date submitted: 08 Jun 2010 Electronic form version 1.4