First and second order coherence of exciton-polariton condensates G. ROUMPOS, C.W. LAI\textsuperscript{1}, E.L. Ginzton Lab., Stanford University, USA, A. FORCHEL, Technische Physik, Universitat Wurzburg, Germany, Y. YAMAMOTO\textsuperscript{2}, E.L. Ginzton Lab., Stanford University, USA — The microcavity exciton-polariton system offers the possibility to study condensed matter physics with optical techniques. In particular, condensation of microcavity exciton-polaritons in momentum space, as well as spontaneous buildup of spatial and temporal coherence, were recently demonstrated. We investigate the first and second order coherence of exciton-polariton condensates both in coordinate and in momentum space. We measured the spatial coherence length of up to 20 $\mu$m, while $g^{(2)}(t = 0)$ was measured to be close to 2 for appropriate near- and far-field filtering. This experiment provides insights into the phase and intensity fluctuations induced by polariton interactions.

\textsuperscript{1}Also in National Institute of Informatics, Japan
\textsuperscript{2}Also in National Institute of Informatics, Japan and NTT Basic Research Laboratories, Japan

Georgios Roumpos
E.L. Ginzton Laboratory, Stanford University, Stanford, CA 94305, USA

Date submitted: 26 Dec 2007

Electronic form version 1.4