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| Editorial Board *Photonics Letters of Poland* |  | November 24, 2016 |

Dear Editors,

Please find enclosed our manuscript, “Tuning properties of mid-infrared Fabry-Pérot quantum cascade lasers for multiheterodyne spectroscopy” by Lukasz Sterczewski, Jonas Westberg, and Gerard Wysocki, which we would like to be considered for publication in the special issue of *Photonics Letters of Poland* entitled “Ultrafast lasers and their applications”.

Lately, optical frequency combs and their ability to perform rapid and accurate broadband chemical sensing have received notable attention. However, the mid-infrared spectral region, where most low-complexity molecules have their strongest absorption cross sections, has been difficult to target with traditional combs. This has led to added complexity of these systems, which makes them less suitable for cost-effective and low maintenance field-deployable instruments. During the last few years, multimode Fabry-Pérot (FP) quantum cascade lasers (QCLs) have emerged as interesting alternatives. Although the coherence properties and number of modes are typically inferior to a truly stabilized comb, the FP-QCL provides a simple monolithic light source for high resolution multiheterodyne spectroscopy.

Importantly, mid-infrared QCLs can form relatively stable optical frequency combs due to sufficiently low intracavity dispersion under certain bias and temperature conditions. However, outside these stable regions the lasers may exhibit higher phase noise, precluding spectrally-interleaved multiheterodyne spectroscopy beyond the mode spacing. In this paper we present an analysis of the injection current tuning behavior of a non-dispersion-engineered Fabry-Pérot mid-infrared quantum cascade laser. Specifically, we study the non-linearities in the tuning coefficients of individual modes that lead to non-uniform mode spacing. It is shown that despite these undesired effects, the laser can exhibit stable operation with equidistant RF beat notes and a high degree of mutual coherence, which makes it suitable for high resolution multiheterodyne spectroscopy.

We believe that our work will be of strong interest to the diverse readership of the *Photonics Letters of Poland* journal and we confirm that this manuscript has not been published and is not under consideration by another journal. All authors have approved the manuscript and agree with its submission to *Photonics Letters of Poland*.

Sincerely,

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