

Nonlinear Optical Sources based on Quasi-Phase-Matched Media

David C Hanna
Optoelectronics Research Centre
University of Southampton
Southampton SO17 1BJ

The advent of quasi-phase-matched (QPM) materials has had a major impact on the performance of nonlinear optical sources. The larger available nonlinearity, makes an important contribution, as does the ability to focus tightly by virtue of non-critical phase-matching. Furthermore the use of aperiodic QPM patterns offer functionalities that do not exist in conventional homogeneous, nonlinear crystals.

This talk, starting with the basic principles of quasi-phase-matching, will go on to review a number of recent achievements with QPM materials. An emphasis will be given to optical parametric oscillators, where enhanced capability comes from the large gains provided by QPM materials. Consequences of this include much extended long-wavelength tuning, attractive possibilities for fibre-laser-pumped devices, and novel devices, which incorporate a fibre within the feedback path of the parametric oscillator.