

Frequency Conversion Devices based on Ferro-electric Materials and III V Compounds

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Frequency conversion of light by Quasi Phase-Matching (QPM) based on periodically poled, nonlinear ferro-electric crystals (LiNbO₃, LiTaO₃ and KTP), has been widely demonstrated at our labs in the past few years. Recent results of our frequency conversion experiments, and the limitations of the ferro-electric crystals will be presented.

III-V semiconductor materials such as GaAs offer a larger nonlinear coefficient and an extensive transparency range. The quasi phase-matching in such devices is achieved through an orientation-patterned GaAs (Op-GaAs) structure. The crucial steps in the process are the preparation of the orientation-patterned templates, and the MOCVD growth of GaAs- based layers on these templates. The main processing methods, together with the difficulties involved in the production of such devices, suitable for efficient frequency conversion, will be discussed