contain polar dielectrics working in the ultralow-ε regime inspired by phonon-photon coupling. The best pronounced asymmetry results from the common effect of asymmetric coupling and diffractions at the two interfaces, on the one hand, and the ultralow-ε relevant dispersion features, on the other hand. It can be obtained at large and intermediate angles of incidence. Adding a high-ε corrugated layer is required for obtaining of significant transmission at large angles, while both single-fraction and two-fraction nonsymmetric grating can be used at intermediate angles. However, transmission can be quite strong for one of the two incidence directions and can vanish for the opposite direction, even if dispersion does not force zero order, which is responsible for the symmetric transmission component, to be uncoupled. This regime is especially important for small angles, at which the common effect based mechanism is not possible. It can be achieved both with and without the use of the high-ε corrugated layer, depending on the chosen material and geometrical parameters. Hence, co-existence of dispersion relevant and irrelevant unidirectional regimes is not a unique feature of more complex nonsymmetric structures, e.g., photonic crystal gratings. The main regimes of such structured configurations can be replicated in simpler configurations but optimization can be required in order to achieve high transmittance for one of the two directions. Although only two types of simple nonsymmetric gratings have been considered here, more advanced structures could be suggested that exploit the same mechanism. Adjustment of thickness-to-period ratio allow us controlling contribution of desired and unwanted diffraction orders within the unidirectional range.

Acknowledgments

This work is supported by the projects DPT-HAMIT, ESF-EPIGRAT, NATO-SET-181, and by TUBITAK under Project Nos., 107A004, 109A015, 109E301. Contribution of A.E.S. has partially been supported by the Matsumae International Foundation (MIF), Japan under Research Fellowship Program. E.O. acknowledges partial support from the Turkish Academy of Sciences.