

Polarization Independent Birefringence Tunable (BGN)

Ibrahim Abdulhalim, Department of Electro-Optic Engineering, Ben-Gurion University, Beer-Sheva, Israel

Tunable optical filters usually exhibit polarization dependence, which decreases the light throughput and necessitates the use of additional components that complicate the system. We have designed novel broadband, polarization-insensitive birefringent tunable filter arrangements that allow high throughput. The filters are based on a combination of tunable birefringent layers or polarization-dependent filters in combination with one or more of the following components: (i) thin film achromatic quarter waveplates based on the form birefringence of dielectric subwavelength grating structures, (ii) nano-photon metal structures; (iii) omnidirectional dielectric mirrors, (iv) polarization conversion mirrors, and/or (v) reflective polarized beam splitters for circularly polarized light. All these components may be implemented in thin film form on one or more substrates, such that a particularly compact and cost-effective filter can be produced. The birefringent layers may comprise any birefringent or magneto-optic layer, with liquid crystals being particularly suitable. High throughput is achieved by the use of novel polarization conversion disposition of the filter's components.

Goals and Benefits

Polarization independence
High light throughput
Broadband operation
Compact design
Fast tuning down to sub-ms

Potential Commercial Uses and Market

Hyper spectral imaging.
Microscopy.
Optical communication. emergency services

Development Stage and Development Status Summary

Design completed
Prototype under construction


Research Team

Dr. Ibrahim Abdulhalim, dep. of Electro-Optic Engineering, Ben-Gurion University, Beer-Sheva, Israel

Patent Status

Patent Pending

Contact for more information:

Zafir Levi , VP Business Development Engineering,

BGN Technologies Ltd. - Technology Transfer Company of Ben-Gurion University, POB 653, Beer-Sheva, 84105, Israel. Tel: +972-8-6236949 Fax: +972-8-627-6420