

Ion-exchanged glass / ion-irradiated KYW hybrid waveguides

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Hybrid waveguides consisting of ion-irradiated KYW directly bonded to ion-exchanged glass waveguides were fabricated and characterized. The ion-exchanged waveguide consists of a buried waveguide that tapers toward the surface to form a hybrid mode with the KYW slab. The KYW has been processed with swift heavy ion irradiation to create a low-index amorphized barrier that provides vertical confinement. [1] This hybrid structure acts as a strip-loaded waveguide. Simulations of the device as well as preliminary results on the propagation loss versus KYW interaction length will be reported. This work paves the way towards on-chip amplifiers with minimal coupling losses.

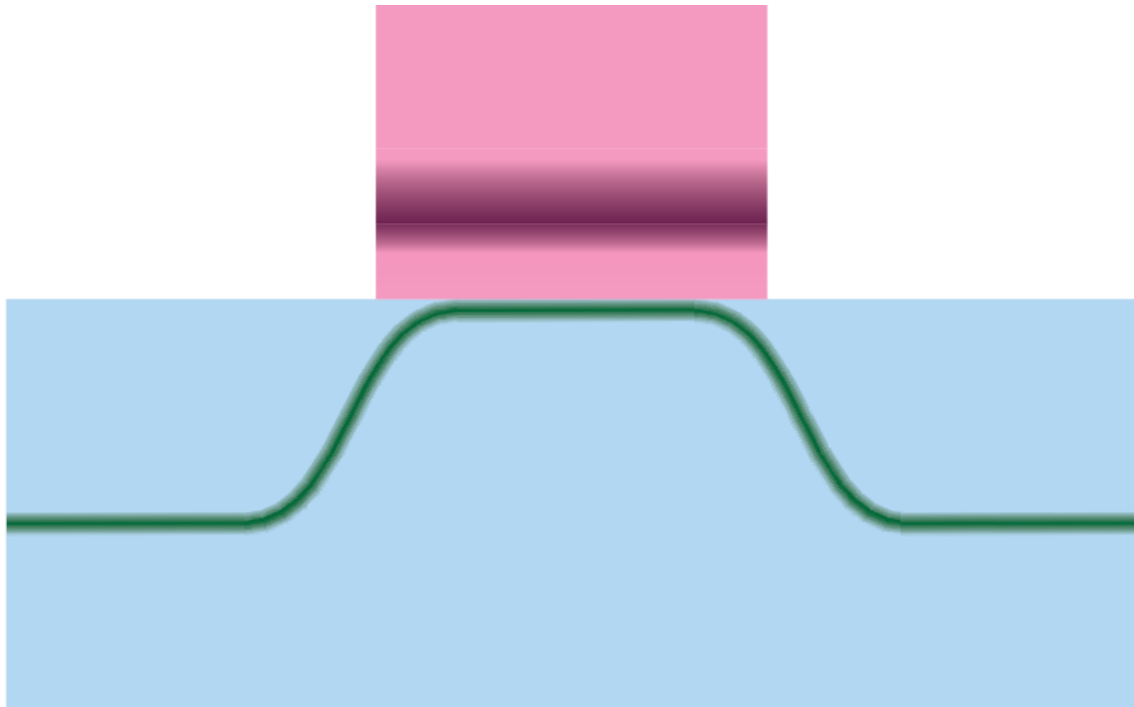


Figure 1: Side view of the structure. Blue: Glass substrate. Green: Buried ion-exchanged waveguide. Pink: KYW with buried amorphized barrier. Light is coupled into the buried waveguide region, which bends toward the surface where it interacts with the KYW slab.

References

- [1] R. N. Frentrop, V. Tormo-Márquez, J. Olivares, and S. M. García-Blanco, “High-contrast slab waveguide fabrication in KY(WO₄)₂ by swift heavy ion irradiation,” Proc SPIE, vol. 10535, p. 105350O, Feb. 2018.