Photonic switching devices by means of polariton redistribution in TMDC's: A comparative analysis between Ψ-shaped and Y-shaped channel guides

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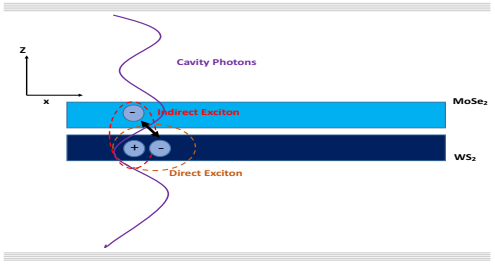
Patrick Serafin[1], German V Kolmakov[1]

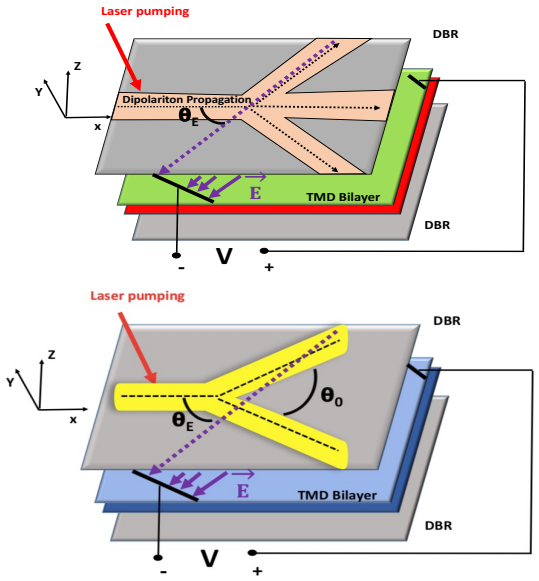
[1] Physics, NYC College of Technology, CUNY, Brooklyn, NY

Dipolaritons



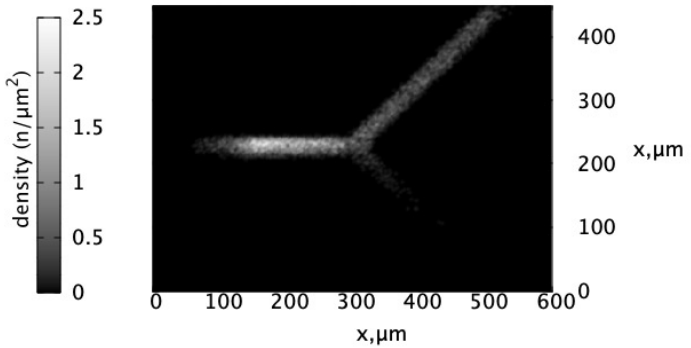
• Dipolaritons are a three way superposition of direct exciton, indirect exciton, and cavity photon.

Photonic Switching



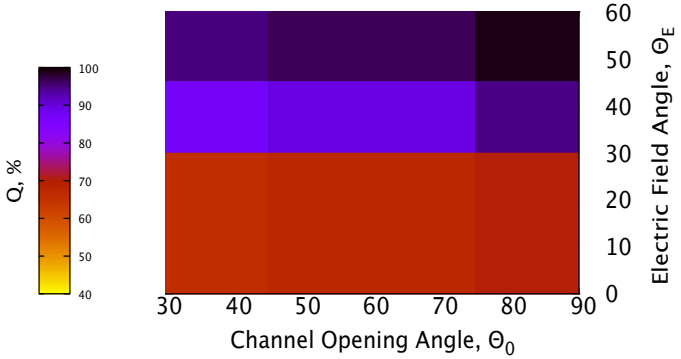
Y-Shaped Channel

• θ_o = 90°, **F** =2.0eV/mm, θ_E = 60 °



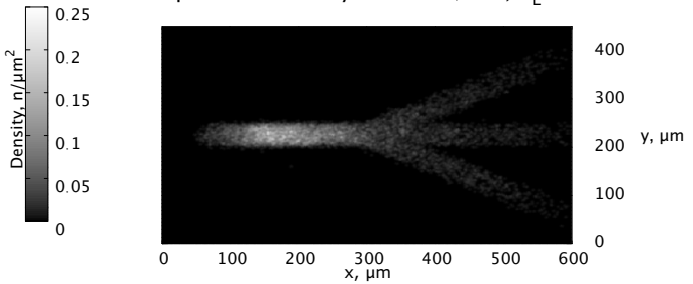
• Performance, Q = $\frac{J_{up}}{J_{low}+J_{up}}$ x 100%

Performance of Channel, Q, for the case of F = 2eV/mm

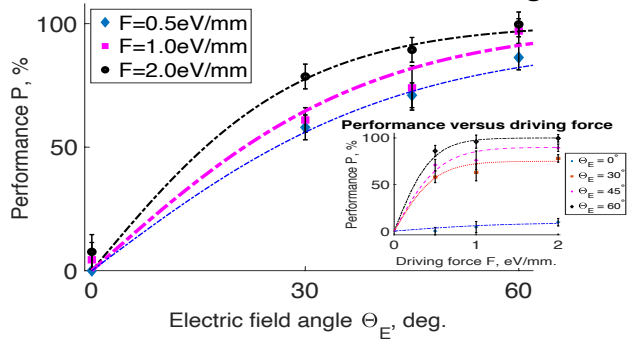


Ψ-Shaped Channel

Dipolariton Density: F = 0.5eV/mm, Θ_E = 0°



Performance versus electric field angle



Conclusions

- Both Y-shaped and Ψ-shaped channel guides provide high performance values (>90%)
- Performance can be improved upon increase of driving force and electric field angle
- Buffered channel closely replicates distribution of a Y-shaped channel .

Acknowledgements

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