

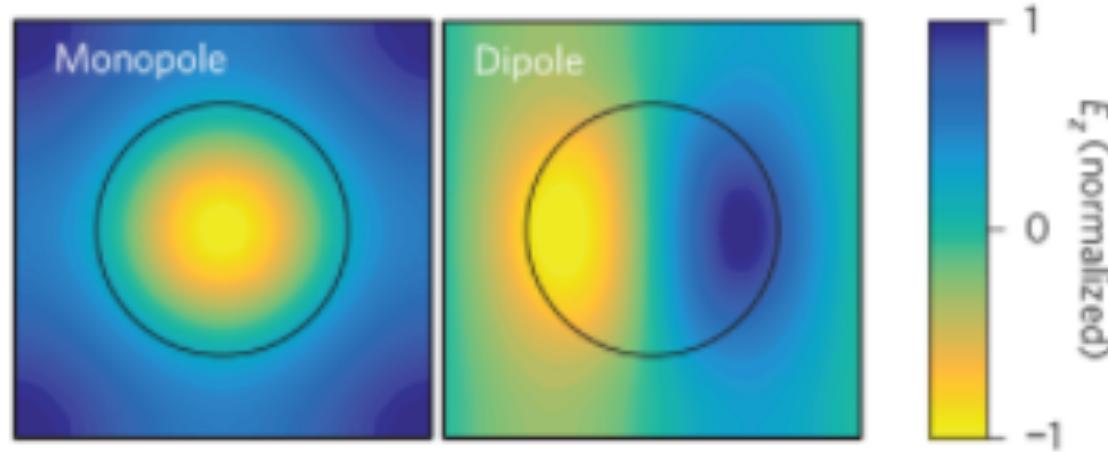
Lossless, Zero Index Metamaterials

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Mazur Group

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Zero Index Metamaterials (ZIMs)

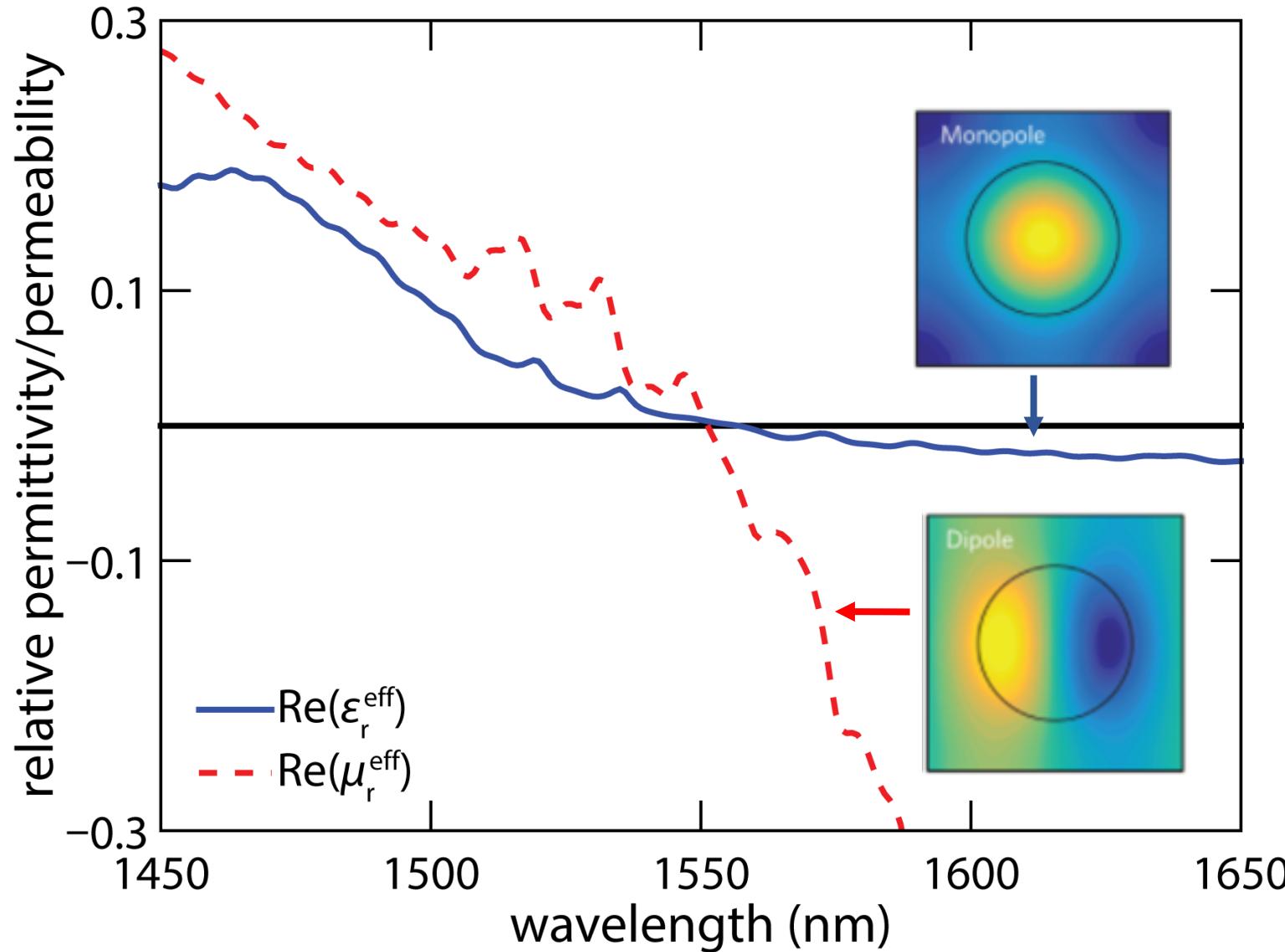


$$\lambda = \frac{\lambda_0}{n}$$

$$n \rightarrow 0$$

$$\lambda \rightarrow \infty$$

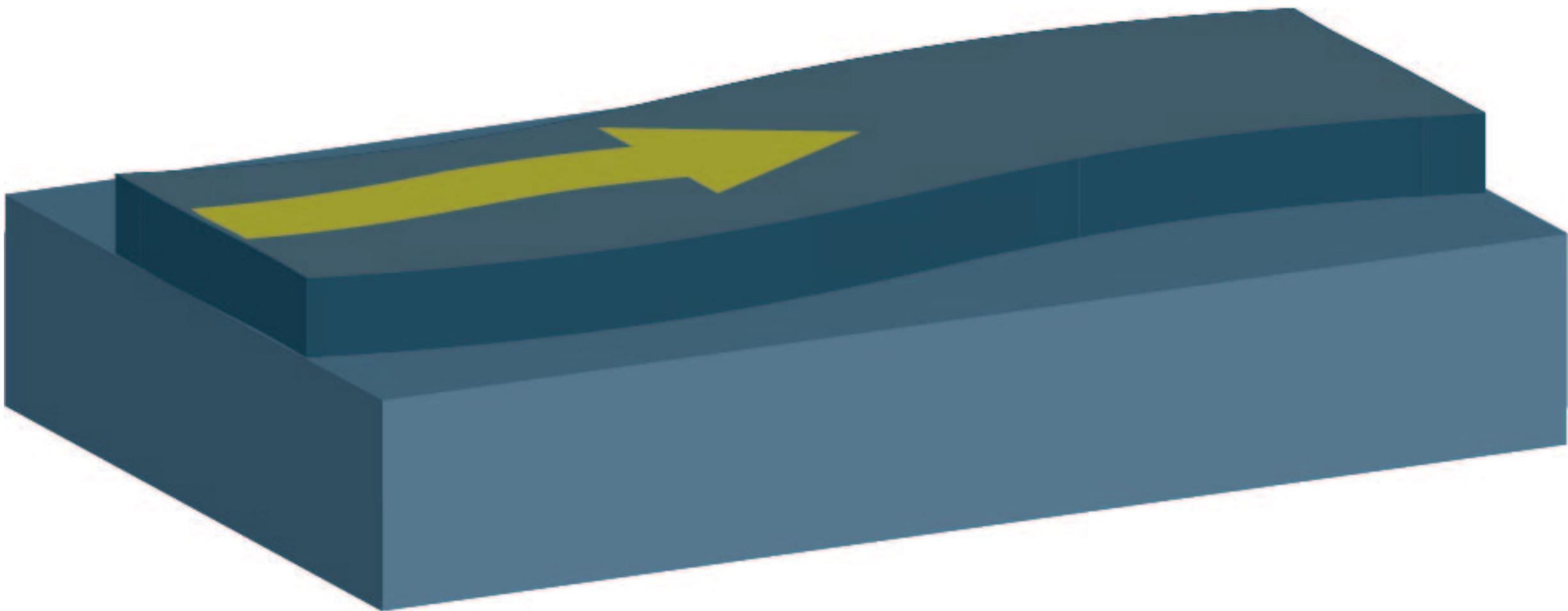
Finding Zero Index: Degenerate mode



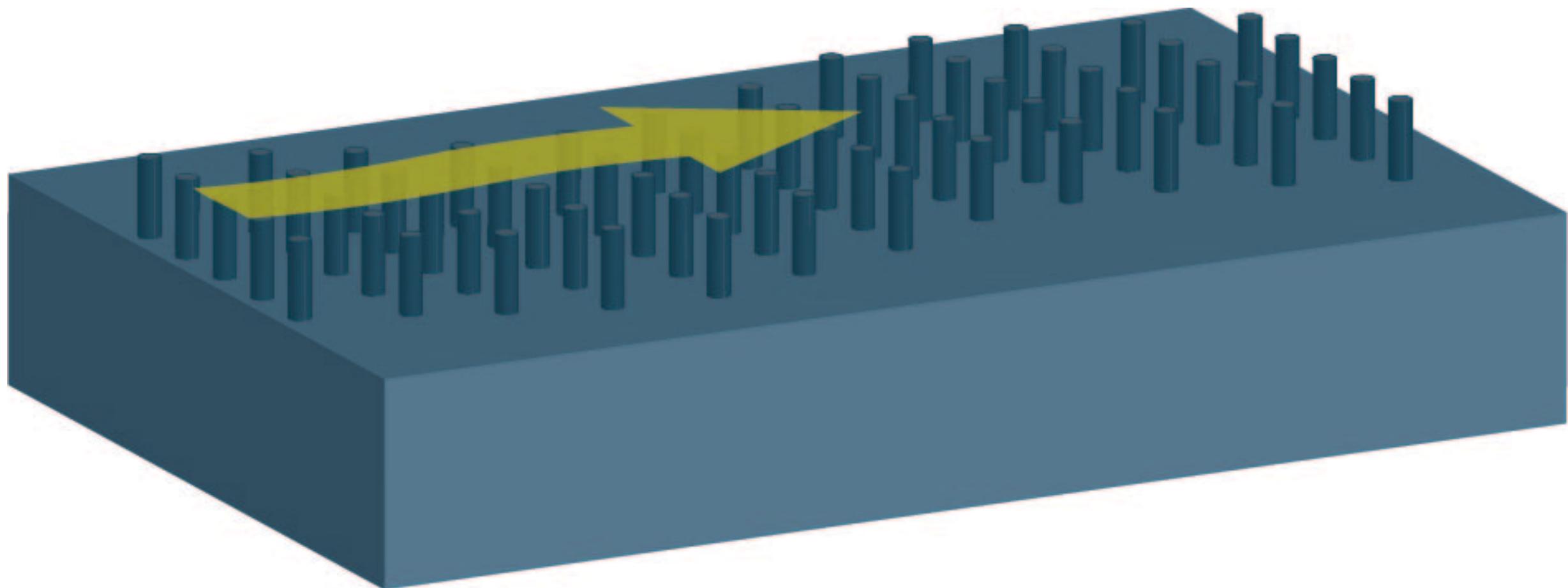
$$n = \sqrt{\mu\epsilon}$$

$$Z = \sqrt{\frac{\mu}{\epsilon}}$$

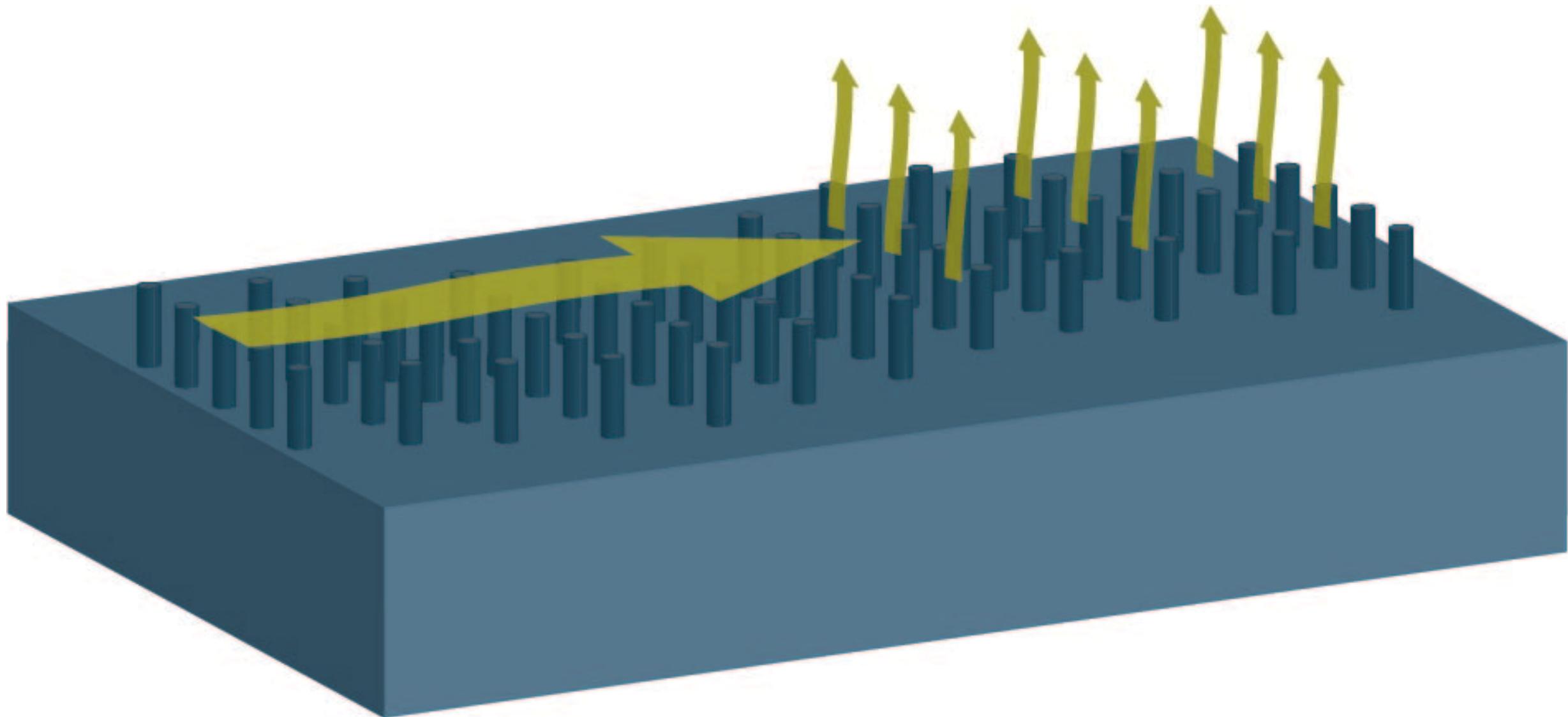
Motivation



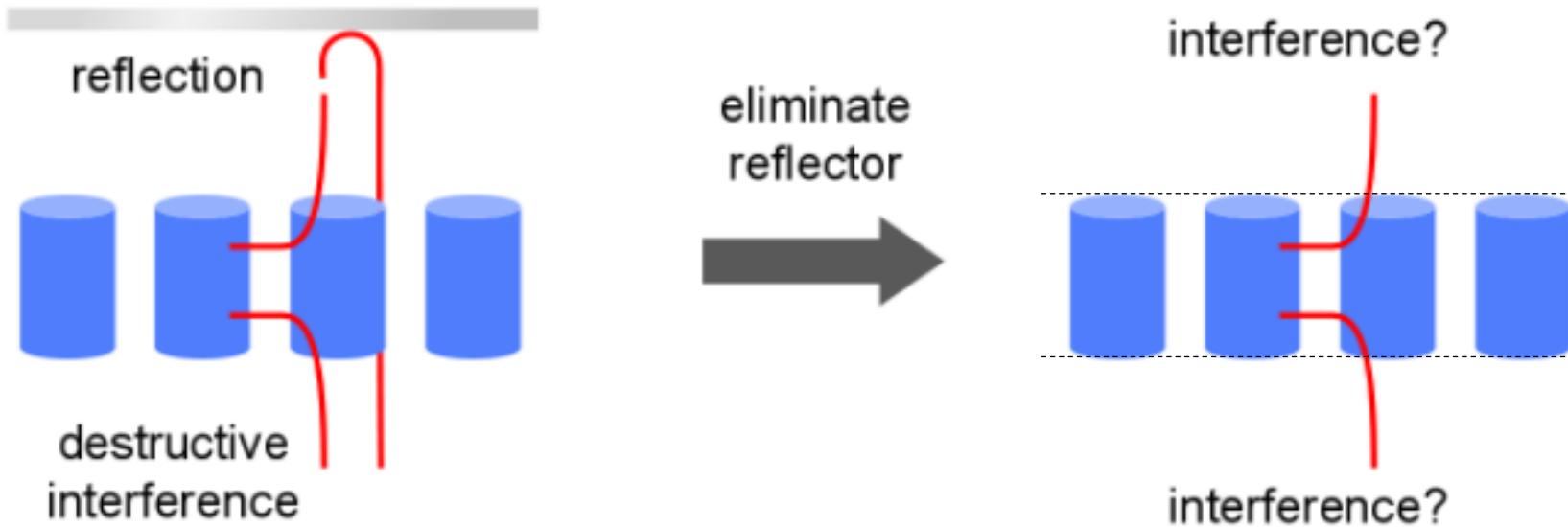
Motivation



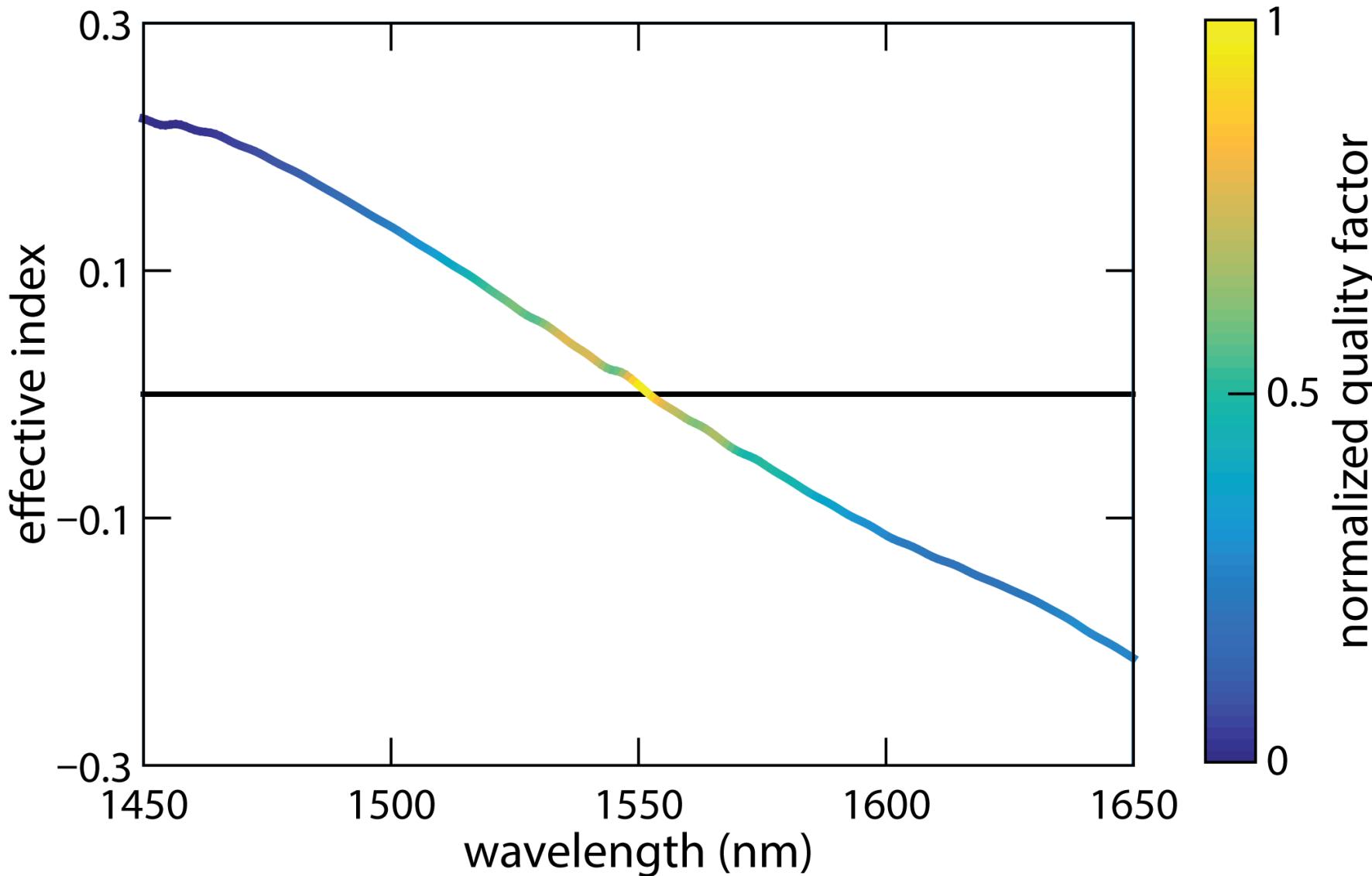
Motivation



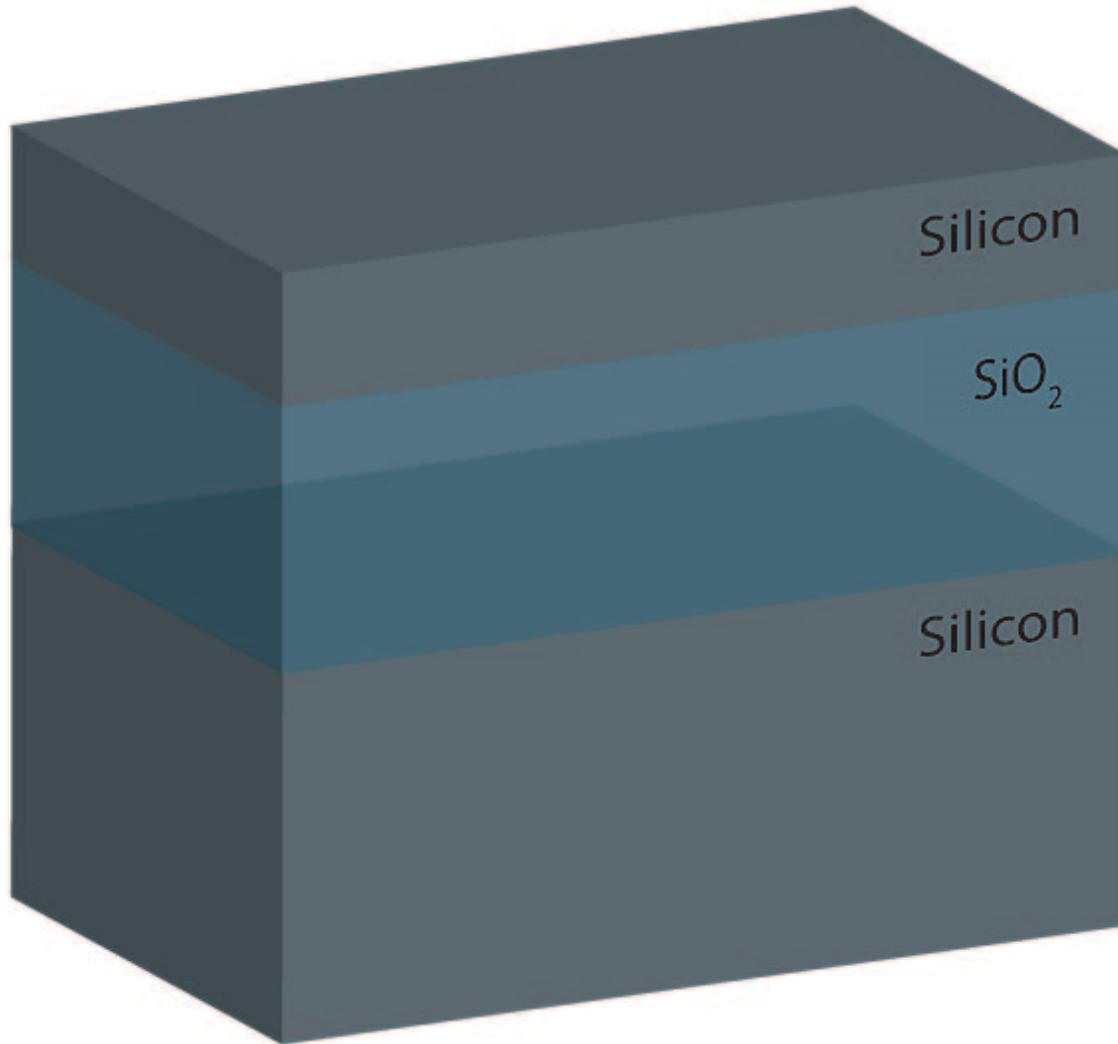
Preventing Loss: A Bound State in the Continuum (BiC)



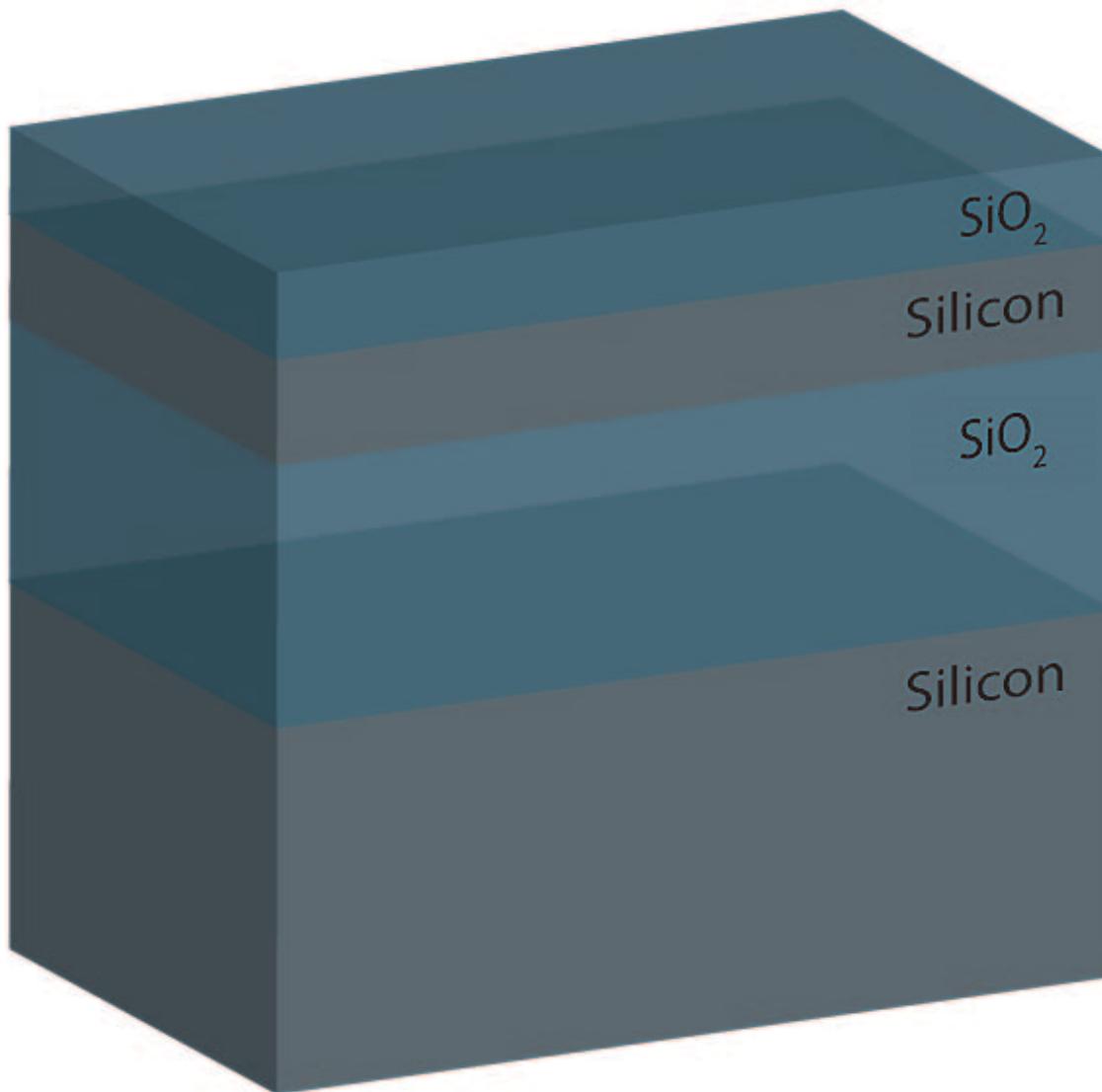
Zero-Index BiC



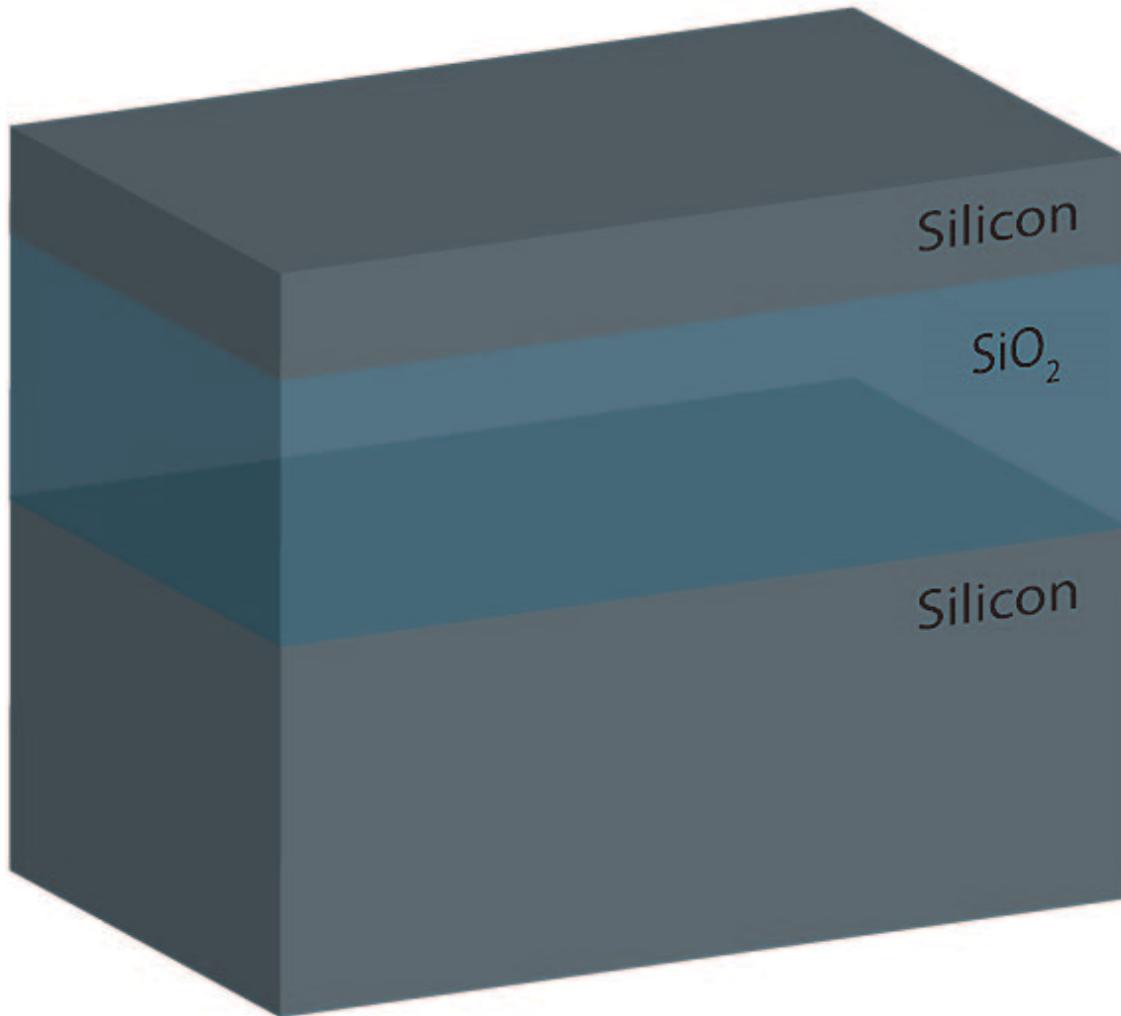
Fabrication



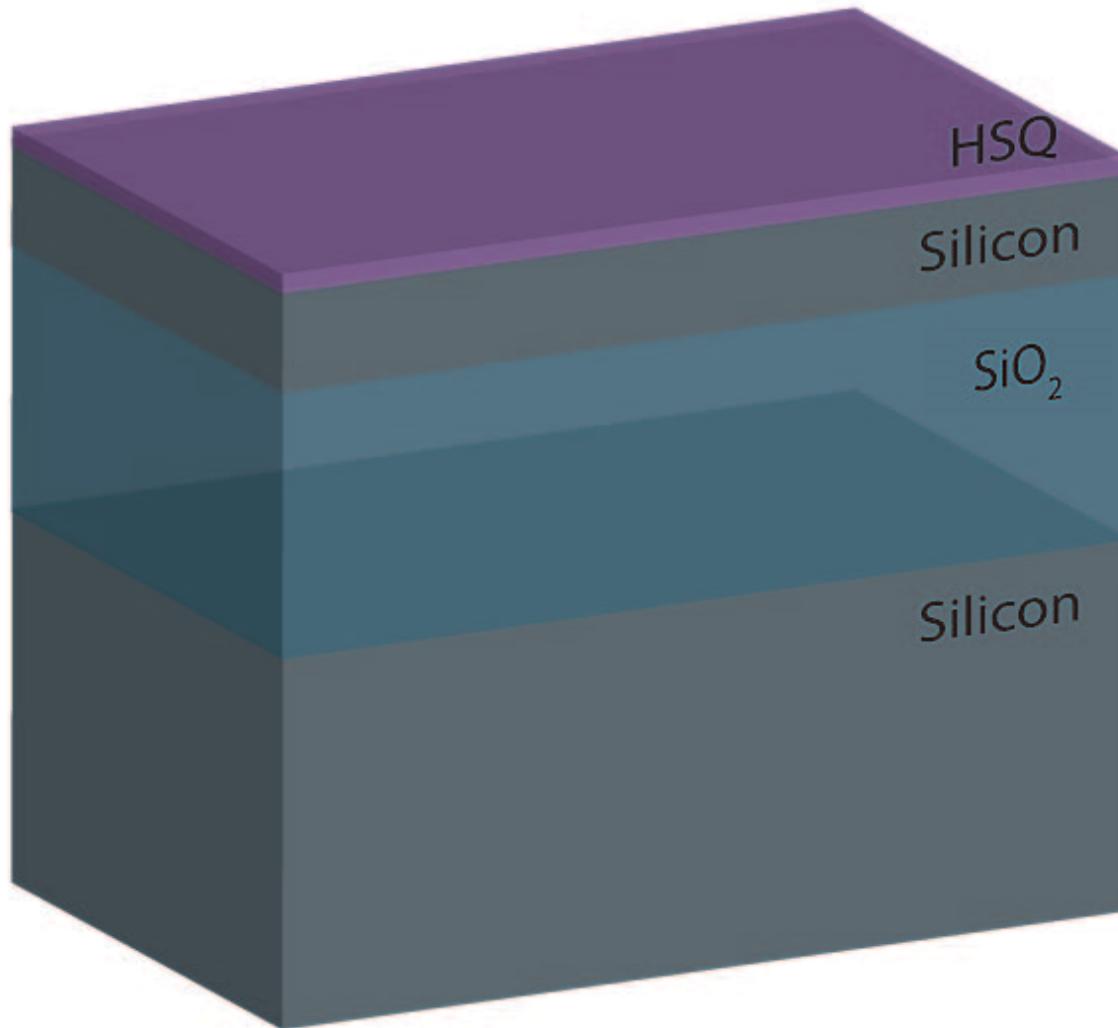
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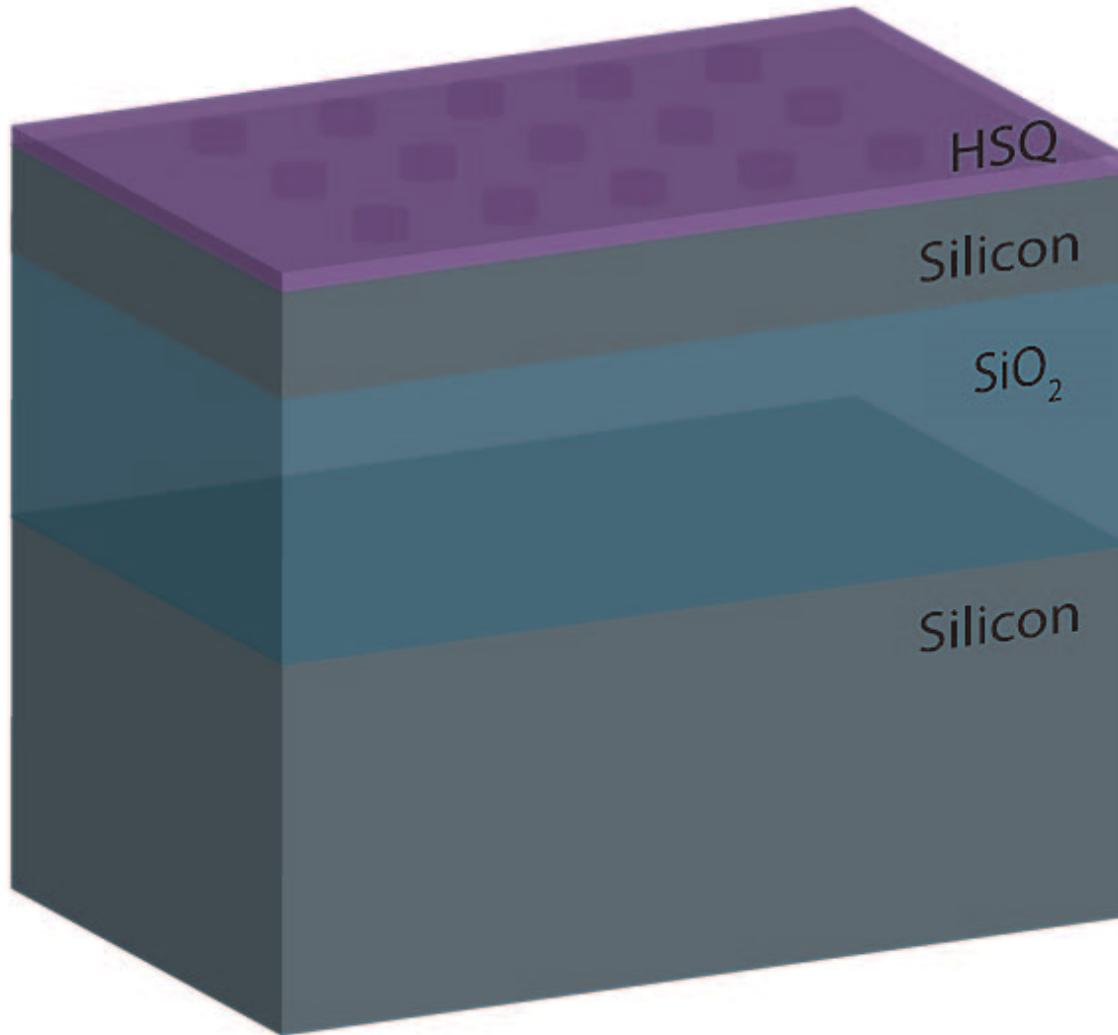
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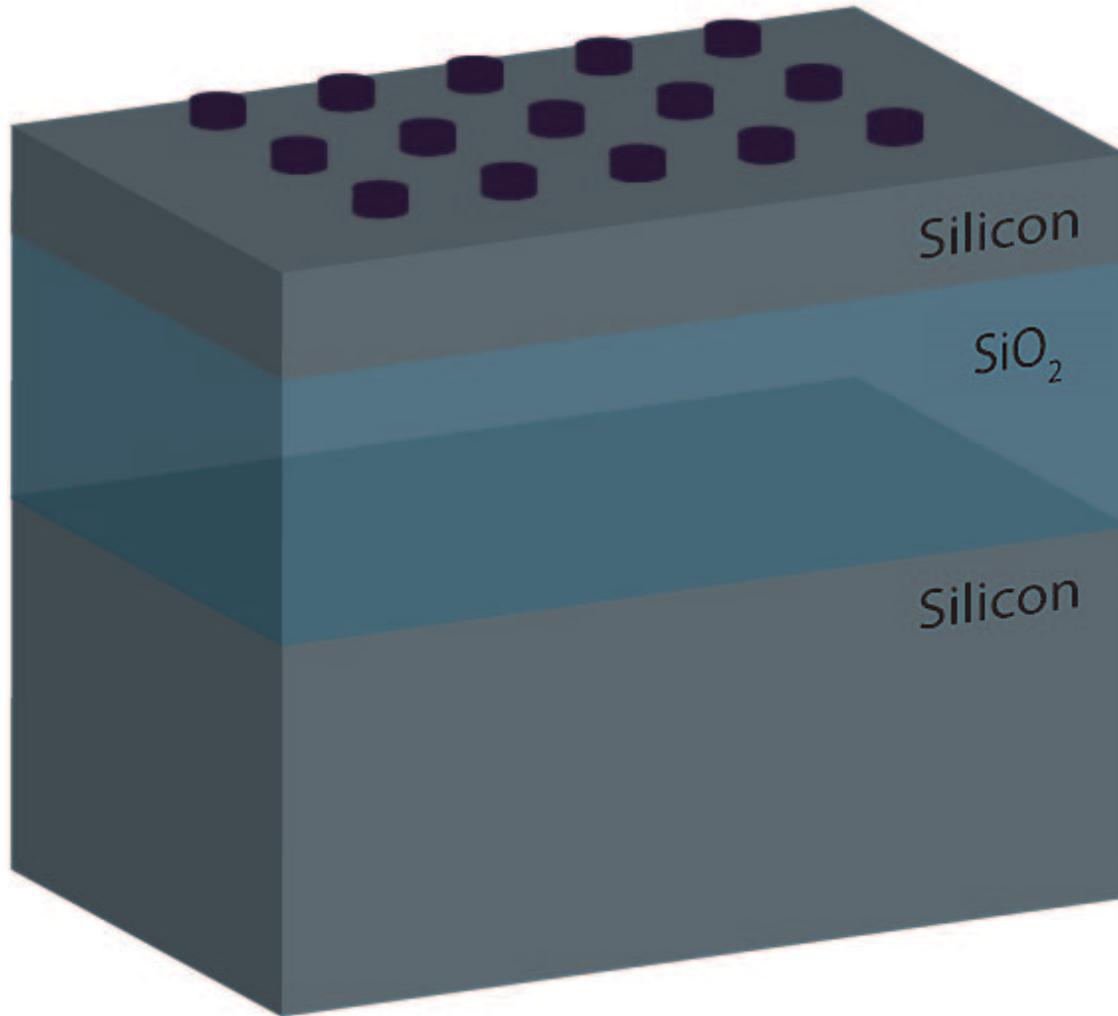
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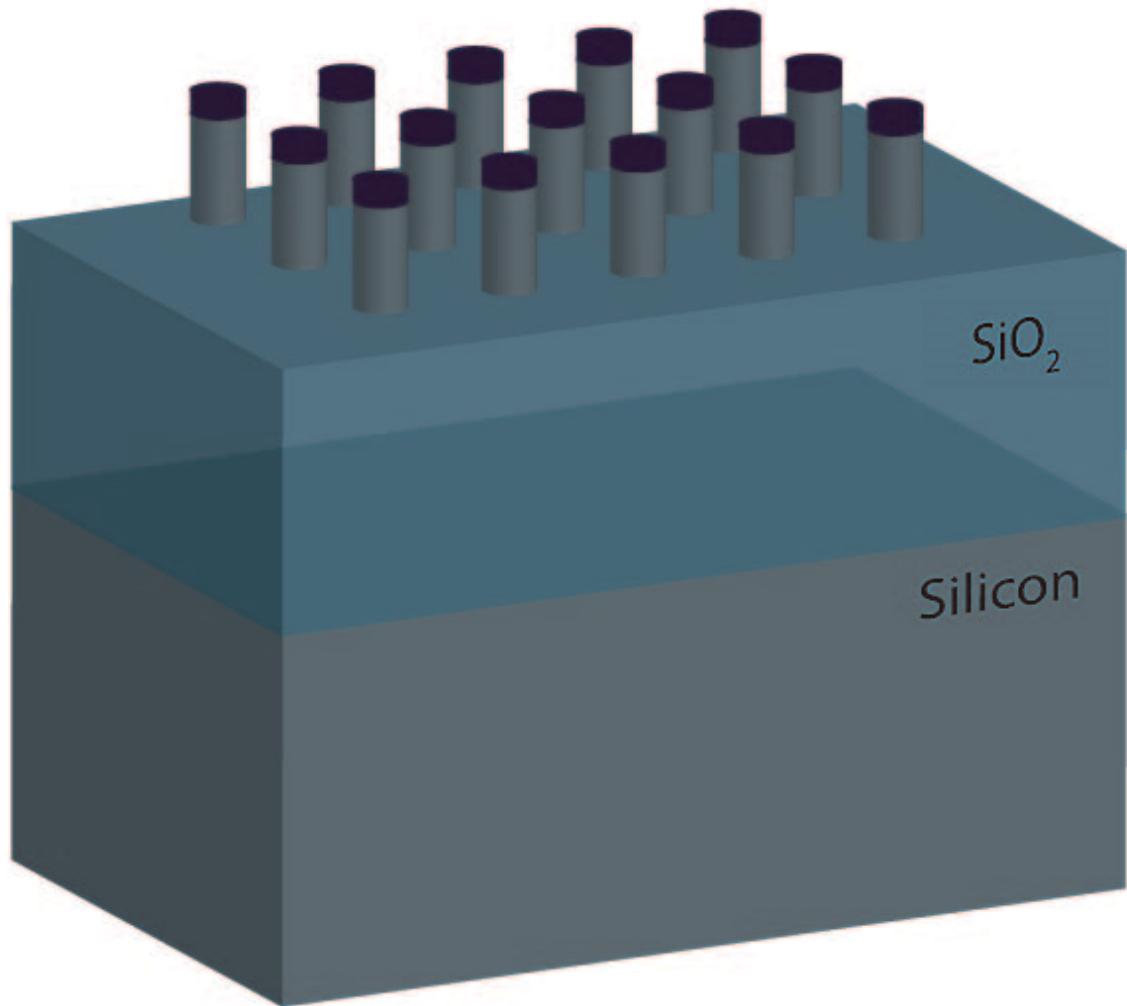
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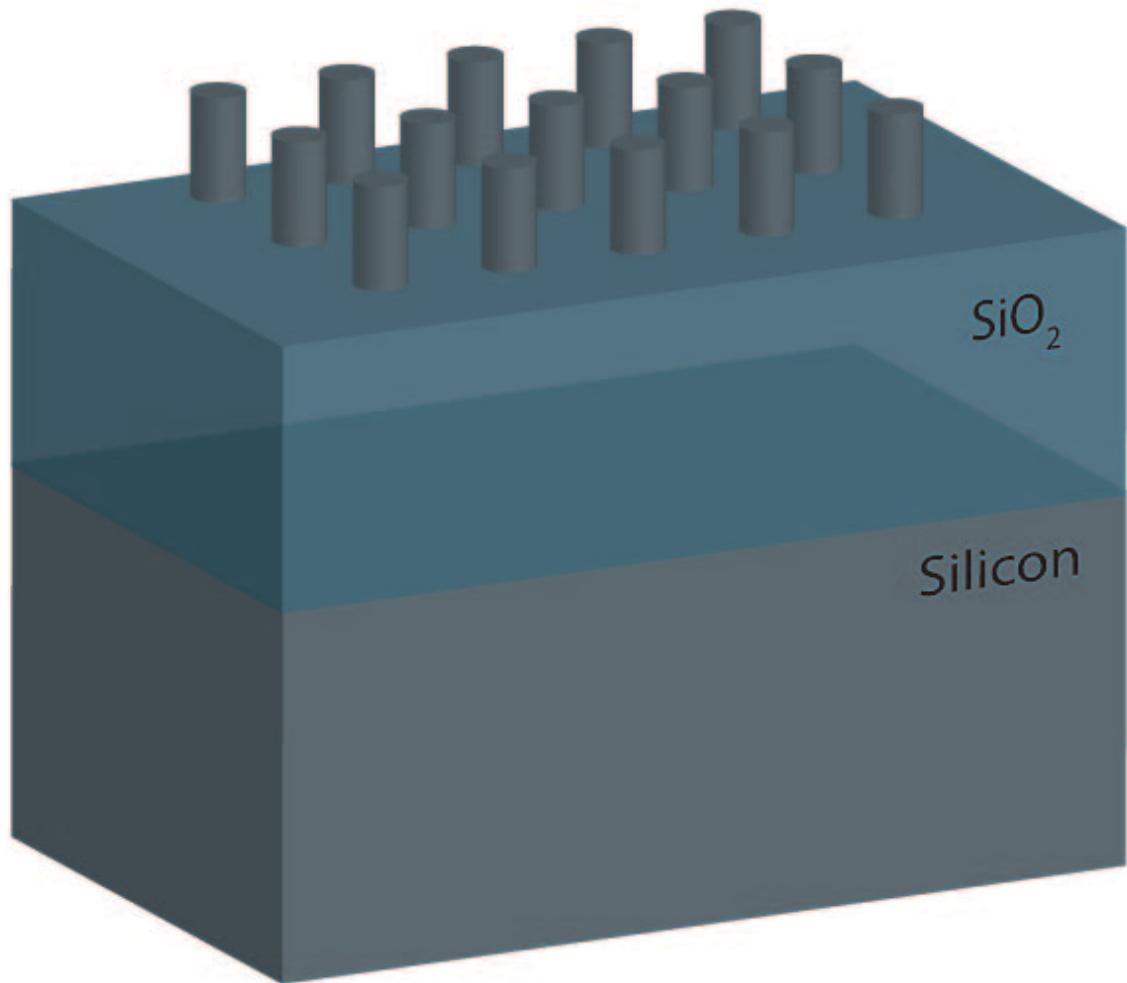
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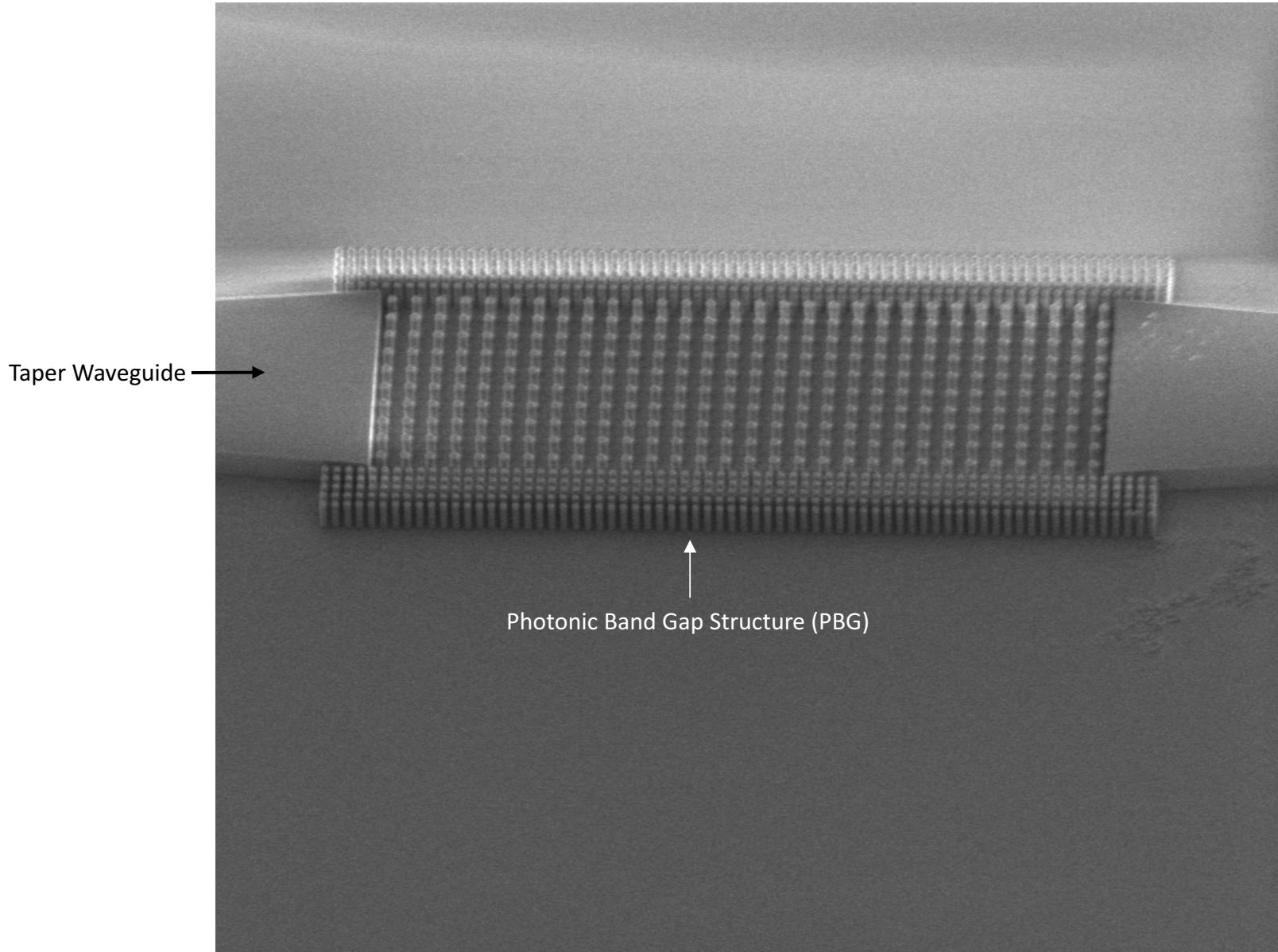
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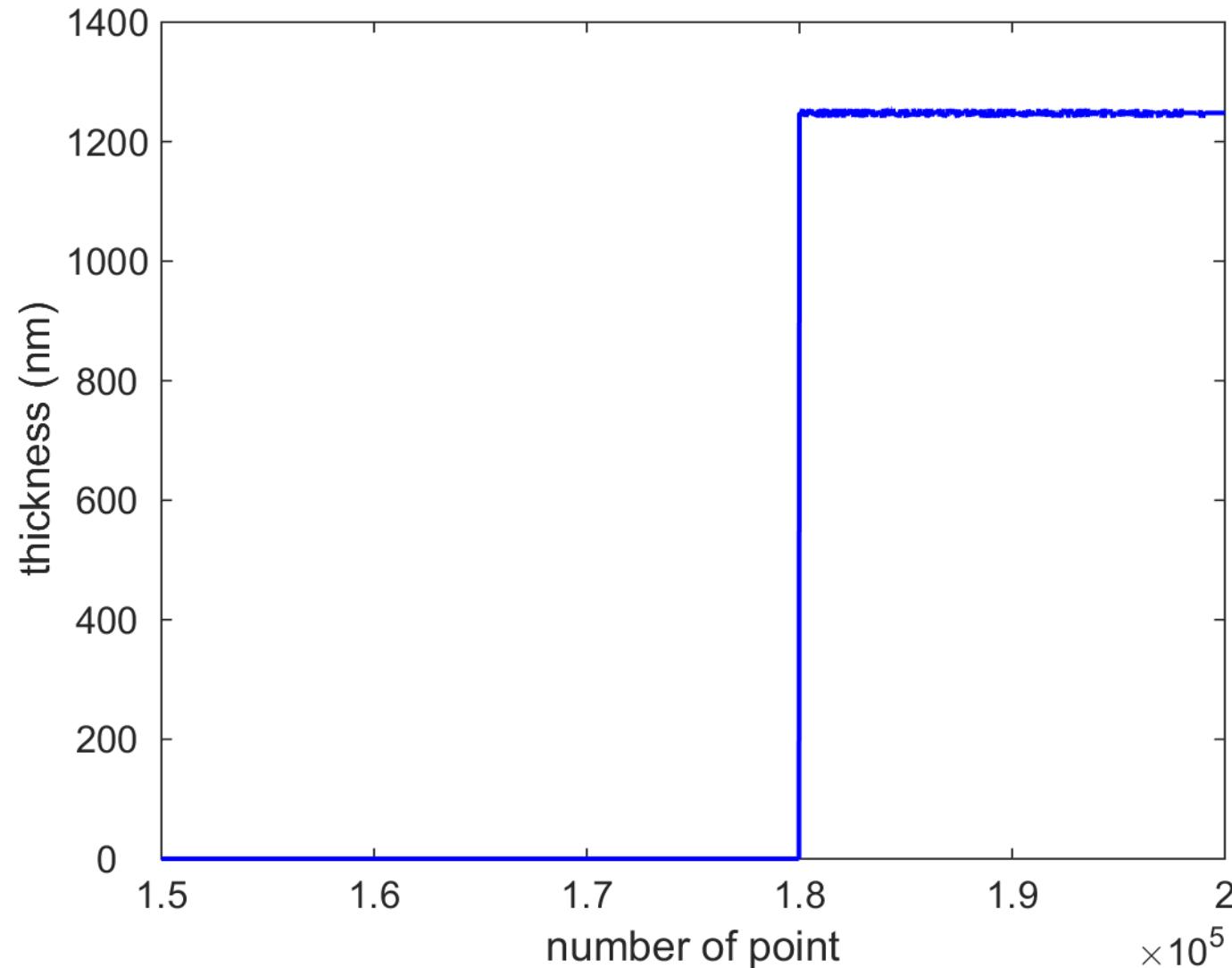
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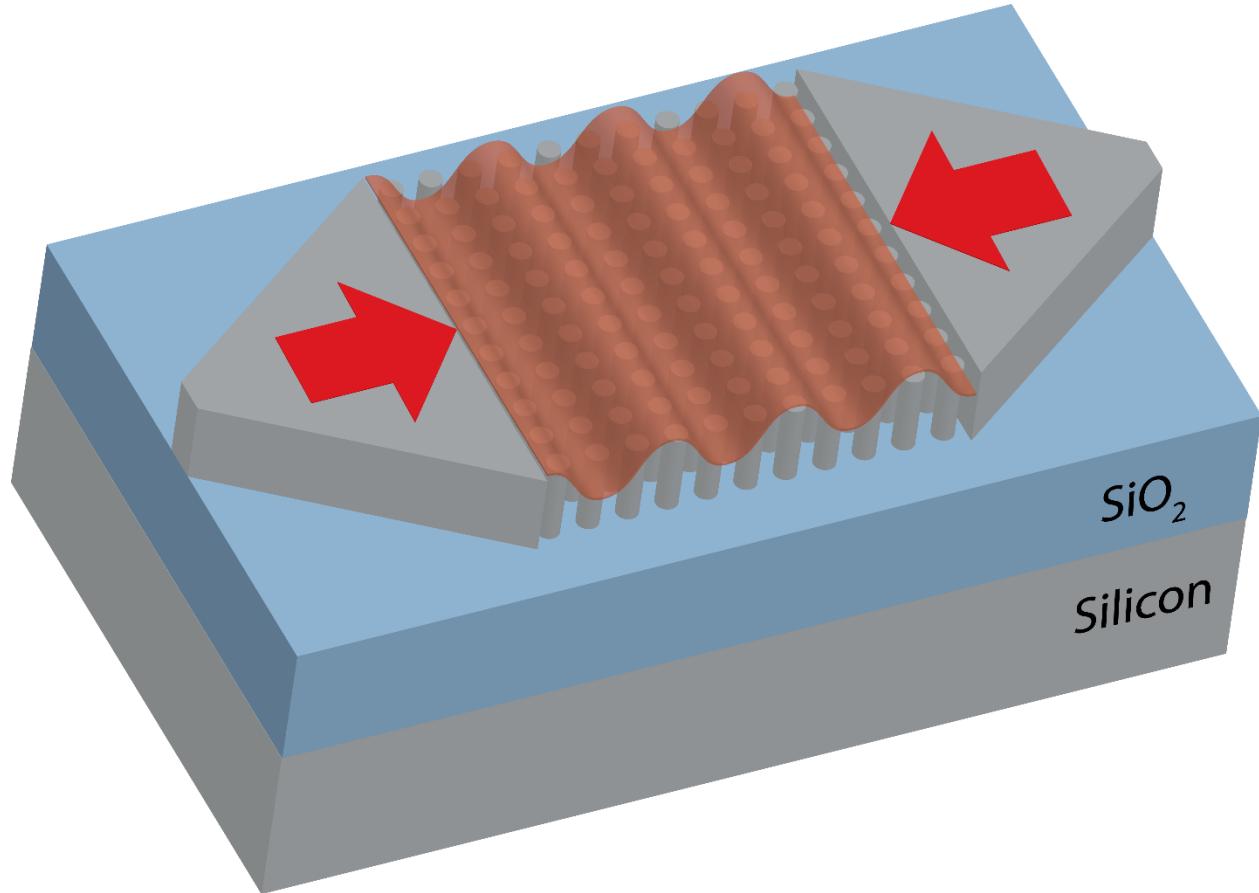
Device



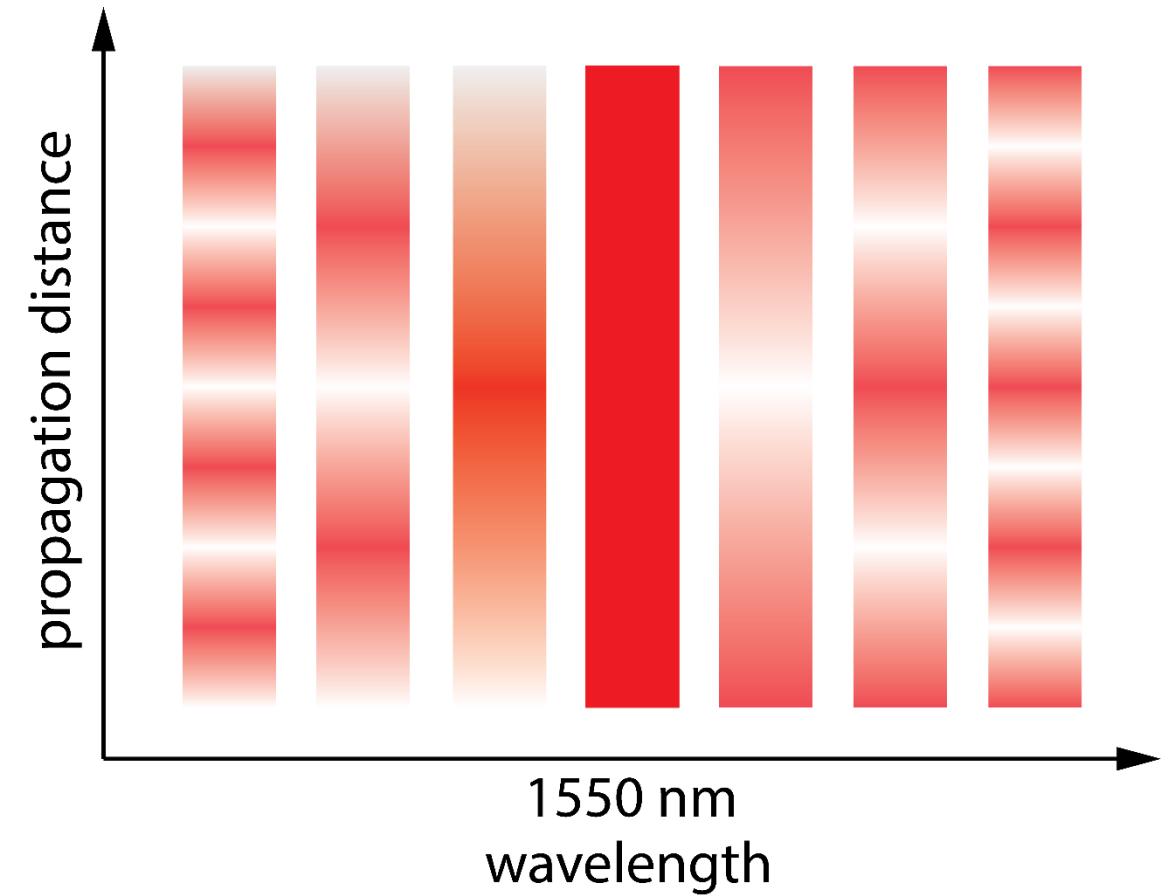
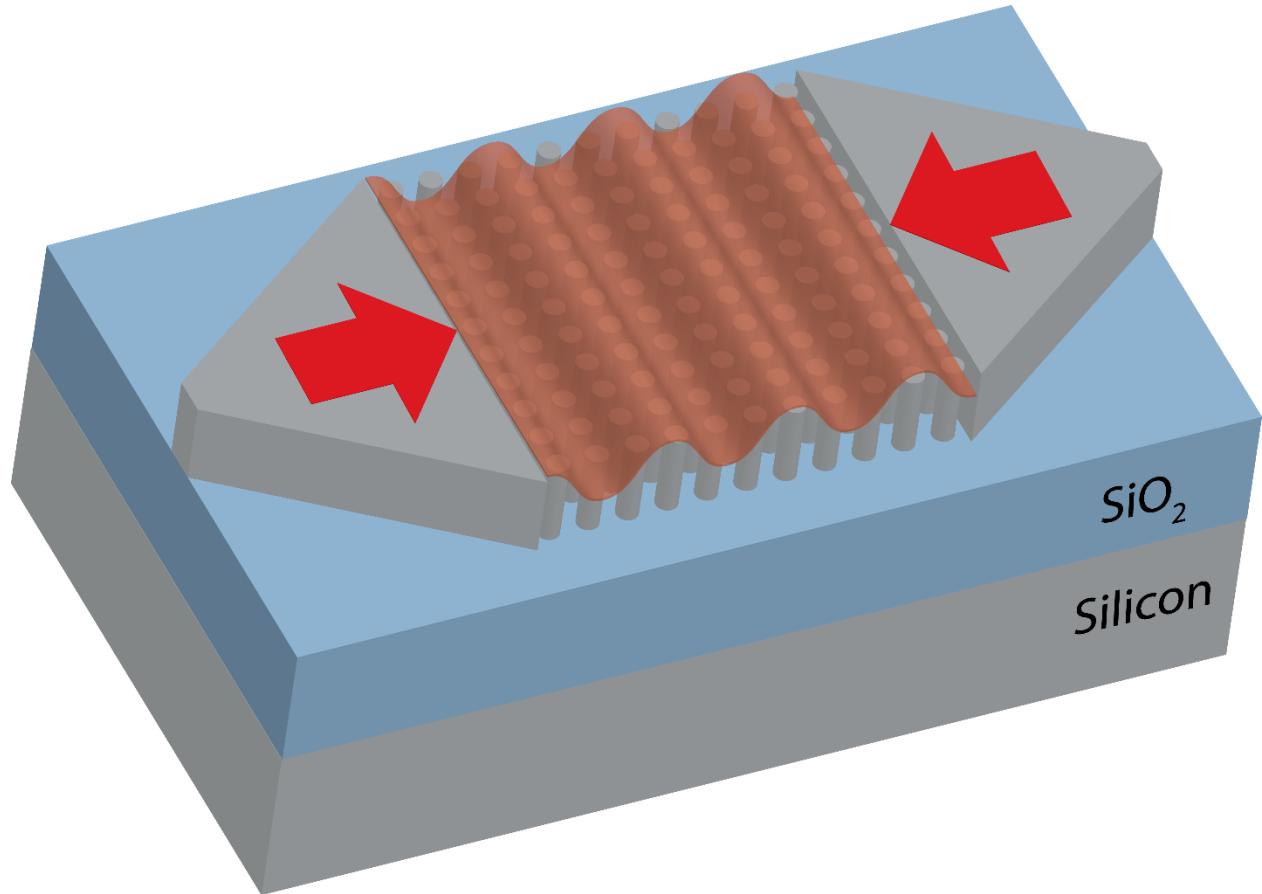
Height Measurement (Profilometer)



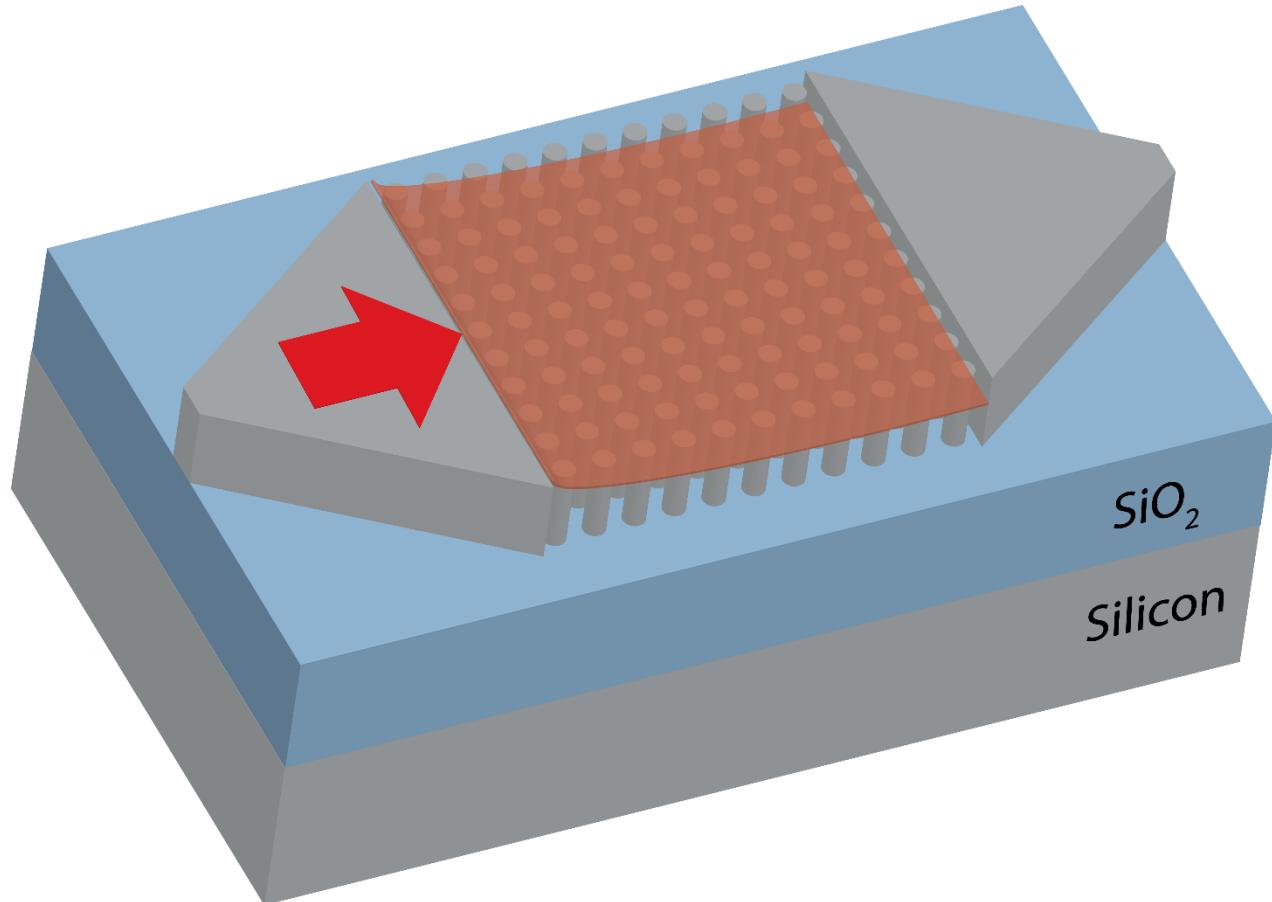
Zero Index Measurement



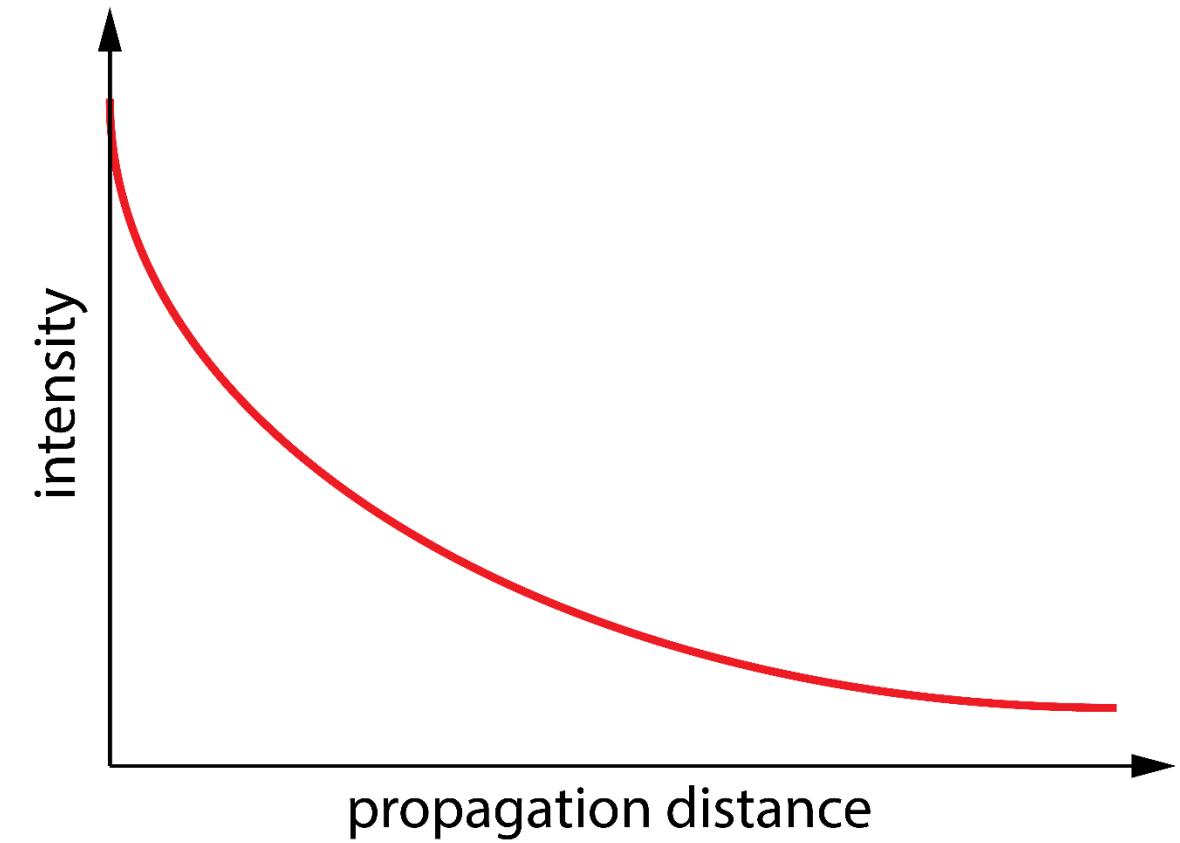
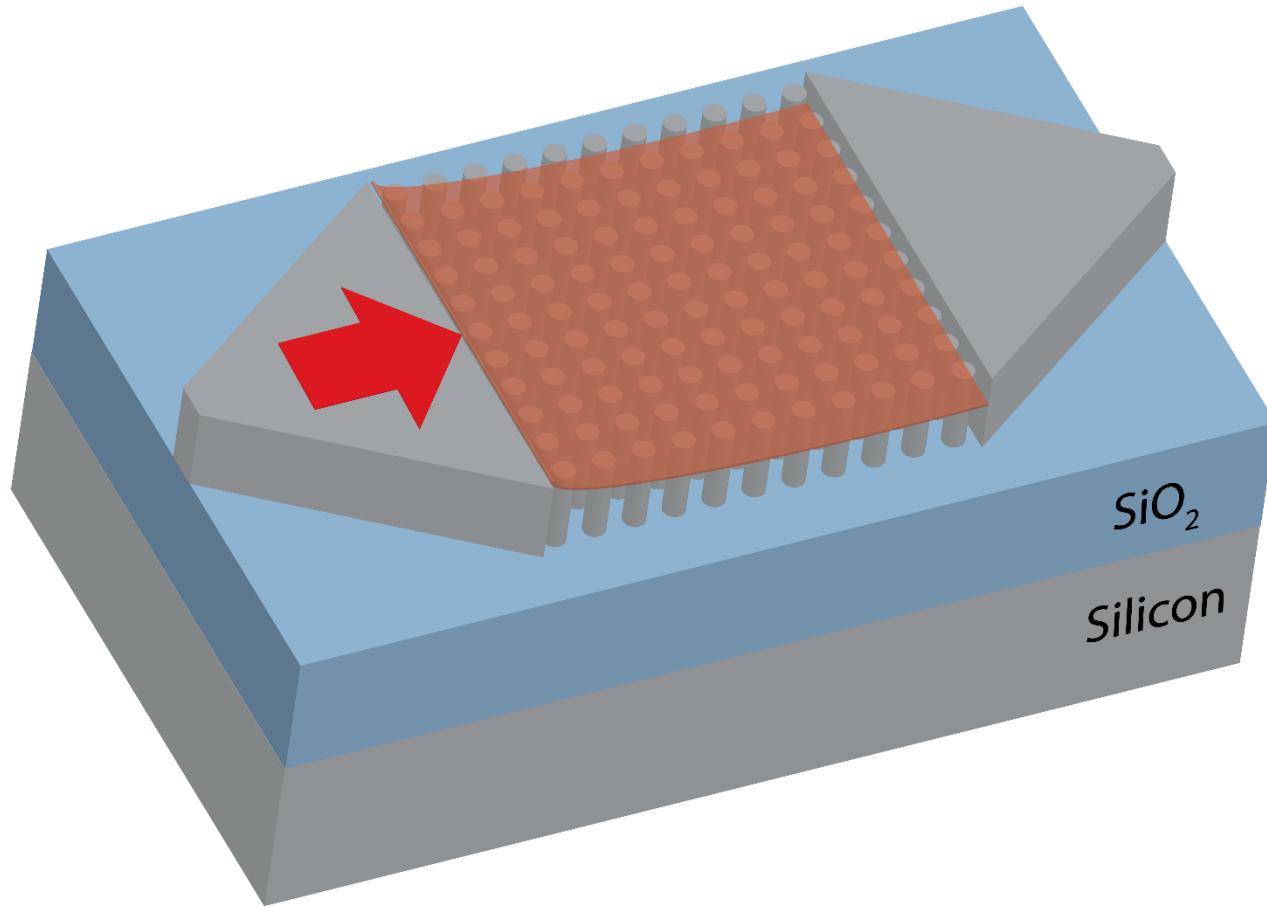
Zero Index Measurement



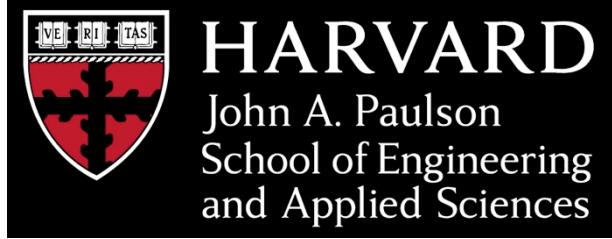
Loss Measurement



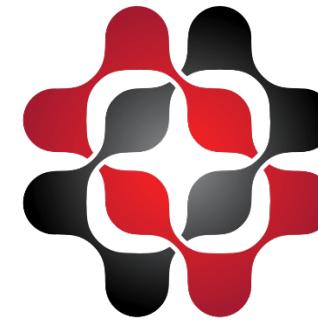
Loss Measurement



Acknowledgements



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Infrastructure



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