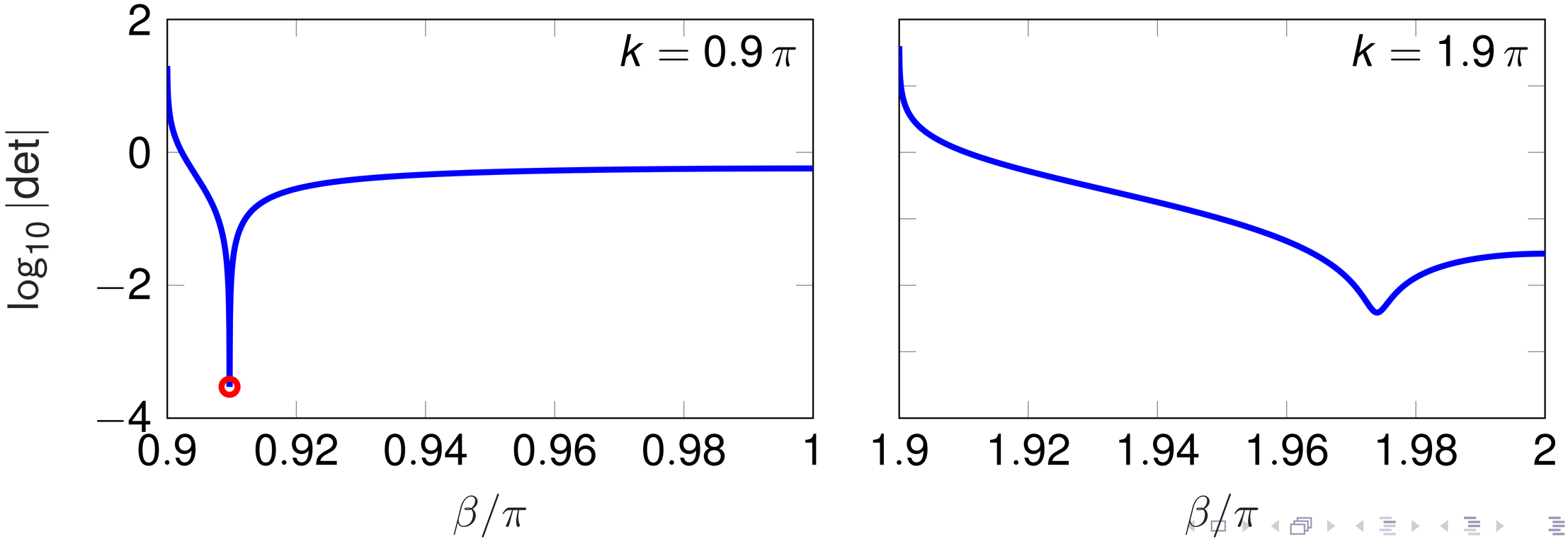
Calculating Rayleigh–Bloch waves: Standard approach

Method: Fixed geometry and $k \in \mathbb{R}$

- Apply (Graf) interaction theory along infinite array.
- Assume quasi-periodicity $\exp(\mathrm{i}\, n\, \beta)$ between cylinders ($n \in \mathbb{Z}$).
- Use lattice sums and derive homogeneous system.
- Determinant = dispersion relation for β.



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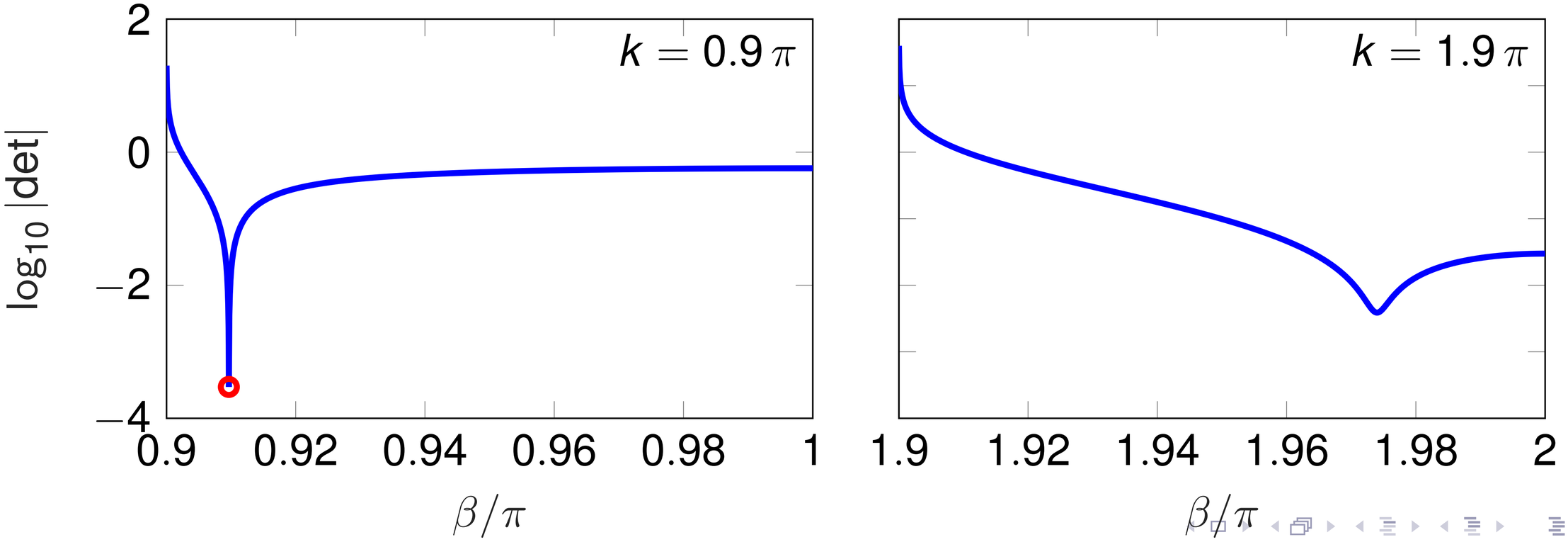
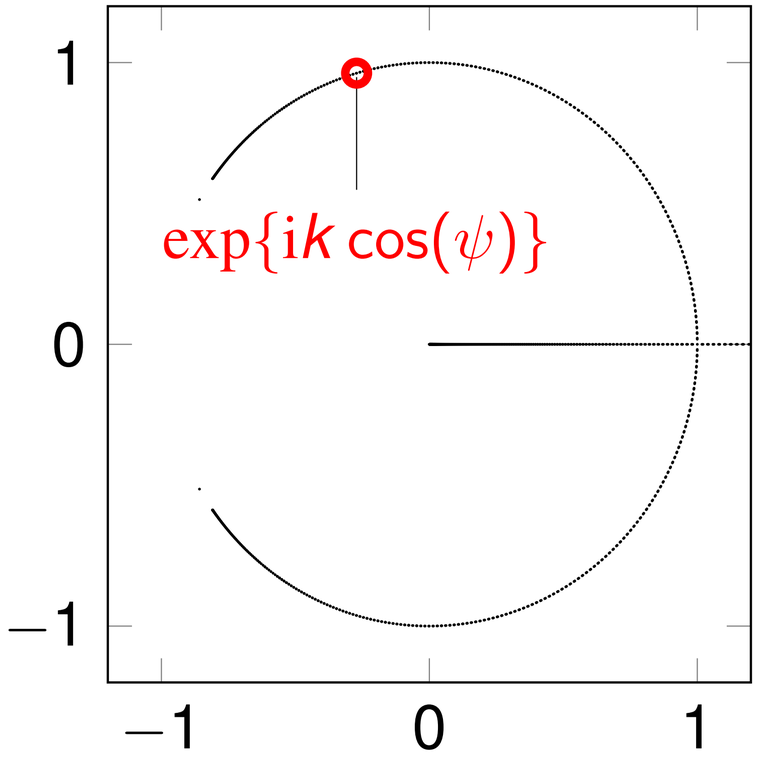
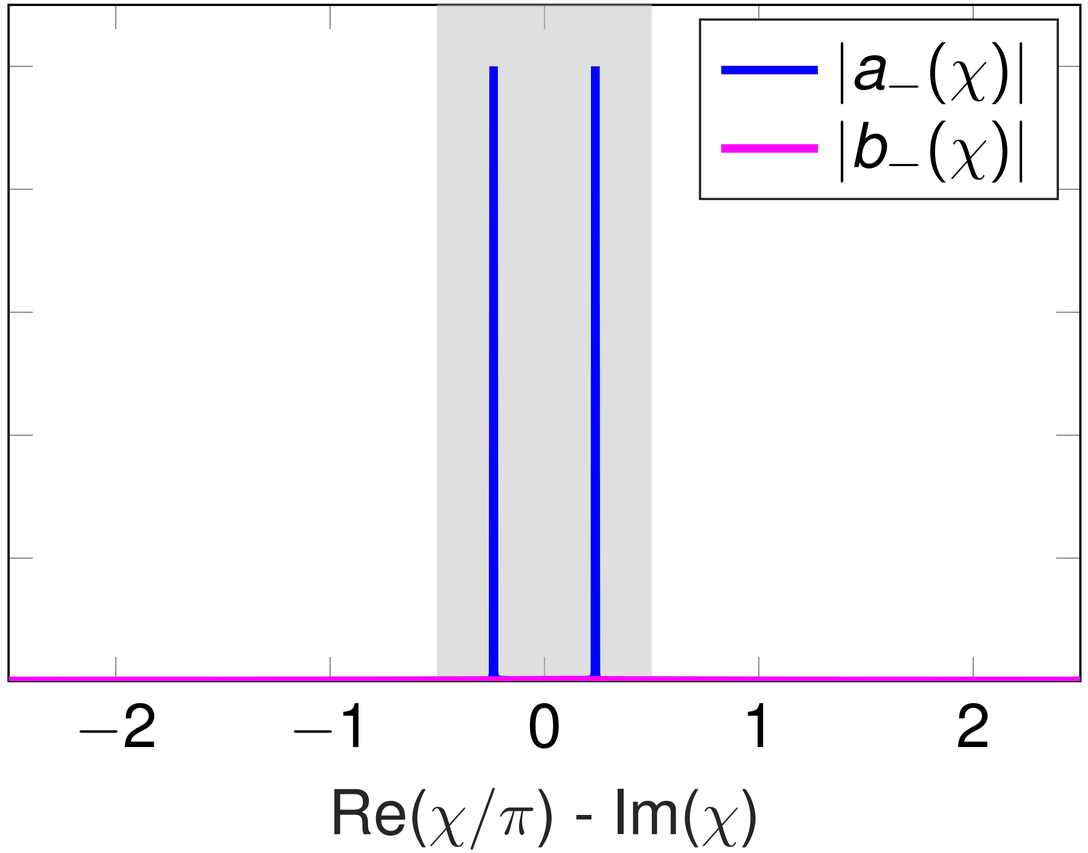


Transfer operator: Spectrum below cut-off

Example: $a = 0.25$; $k = 0.8\pi$

Eigenvalues $\in \mathbb{C}$



Eigenfunction