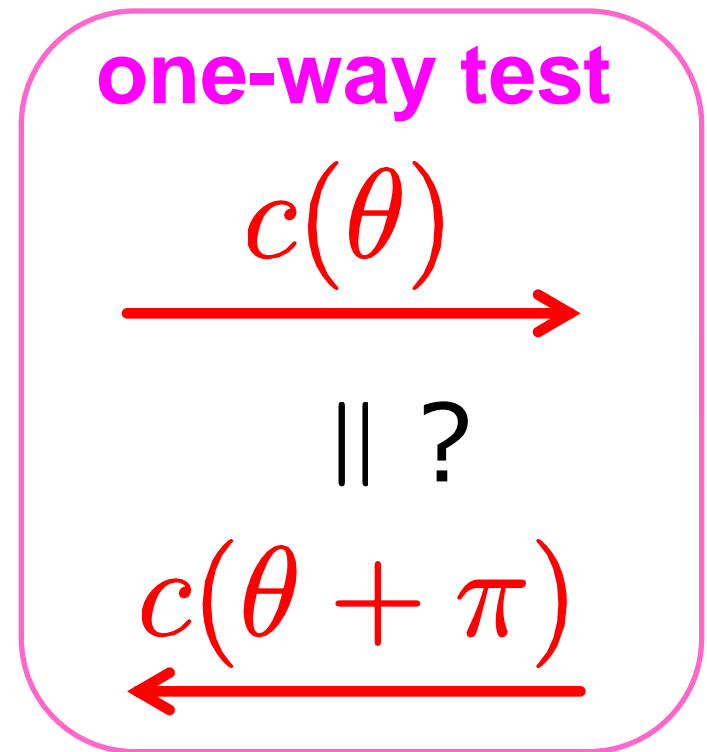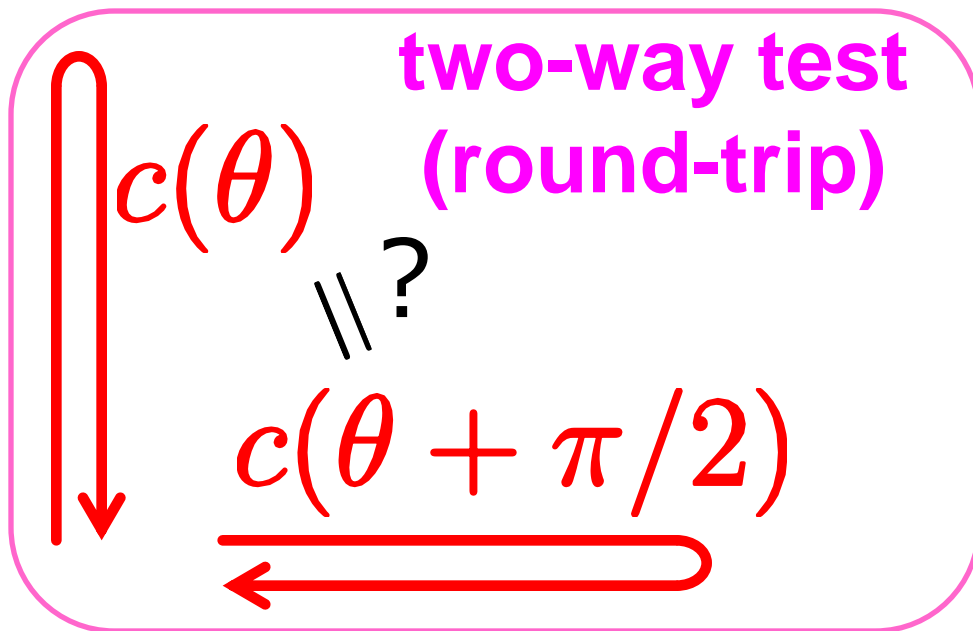# Search for Anisotropy in the One-Way Speed of Light Using an Optical Ring Cavity

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# Testing Isotropy of c

- test of Lorentz invariance in electrodynamics
- 2 types of test

**two-way test (round-trip)**

$c(\theta)$

$\setminus\setminus$?

$c(\theta + \pi/2)$

**one-way test**

$c(\theta)$

$\parallel$ ?
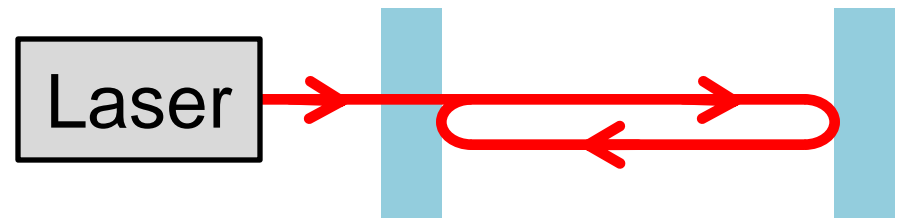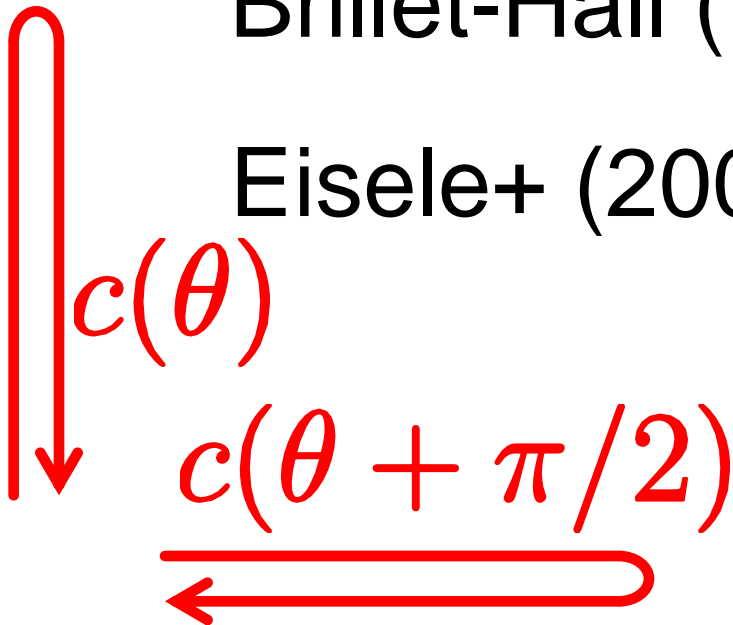
$c(\theta + \pi)$

# Previous Two-way Tests

- improved sensitivity by utilizing lasers and optical cavities
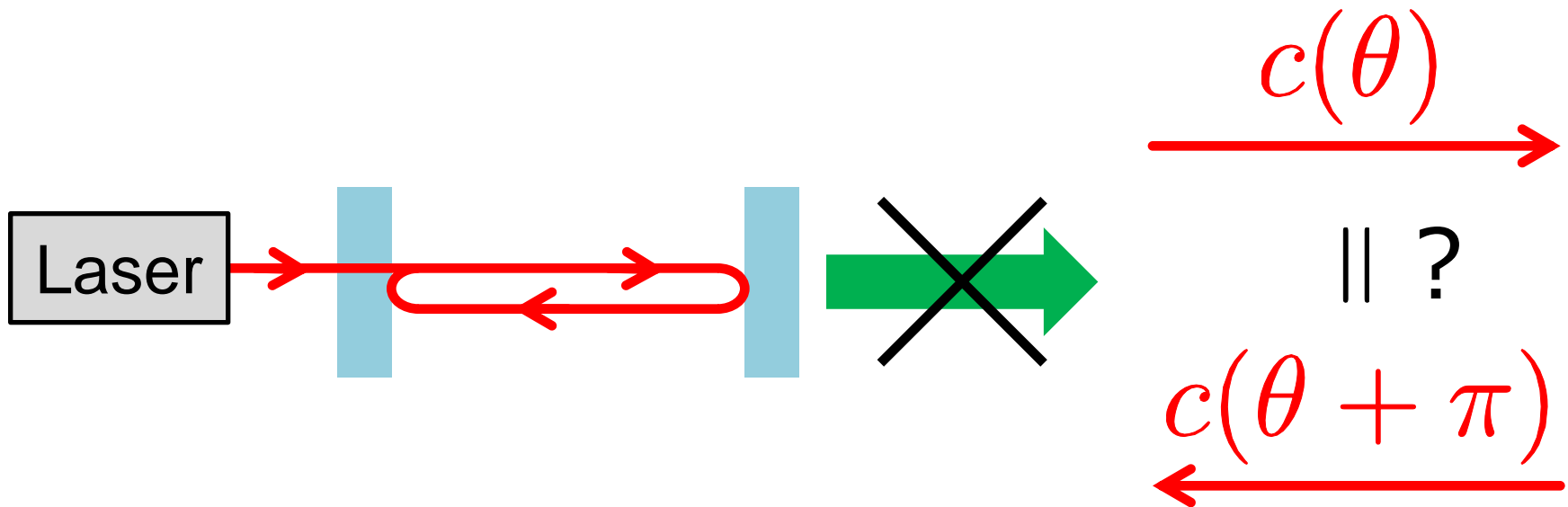
  Michelson-Morley (1887) $|\delta c/c| \lesssim 10^{-9}$

  Brillet-Hall (1979) $|\delta c/c| \lesssim 10^{-15}$

  Eisele+ (2009) $|\delta c/c| \lesssim 10^{-17}$

$c(\theta)$

$c(\theta + \pi/2)$

Laser

# Previous One-way Tests

- unable to test by usual cavities

  cavities are all round-trip

- 3 orders of magnitude weaker limit

$$c(\theta)$$

Laser

$$\| \ ?$$

$$c(\theta + \pi)$$

# Our One-way Test

- cavity with some trick

- set world best upper limit on one-way anisotropy



**Want to know the trick?**

**Come and see our poster!**