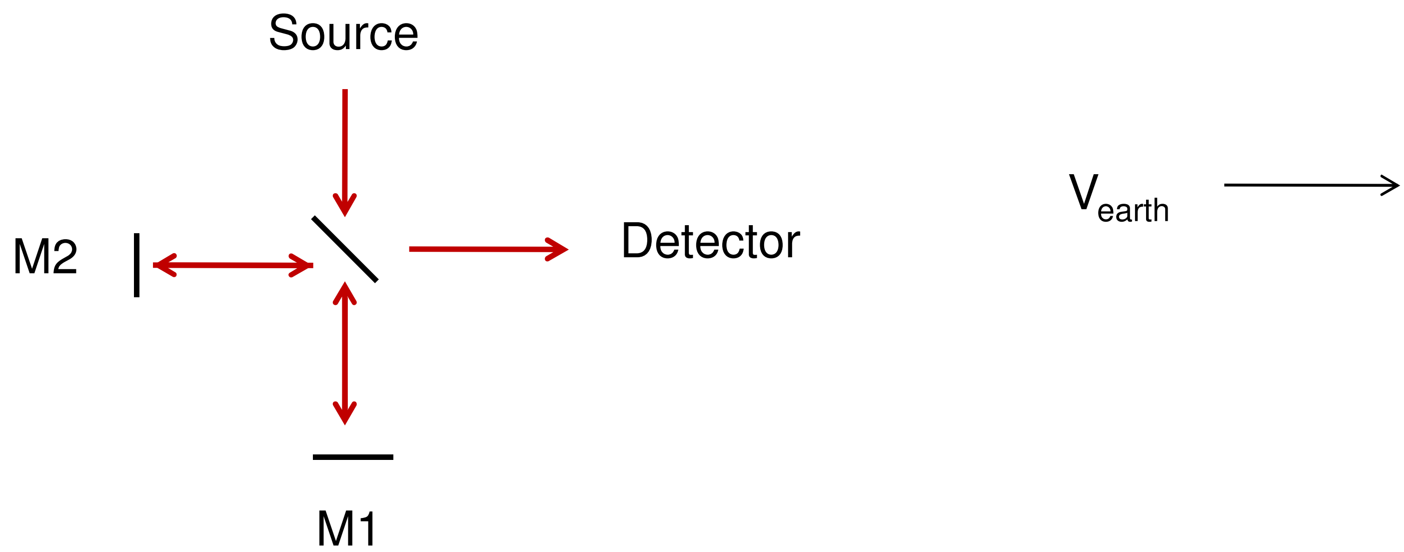
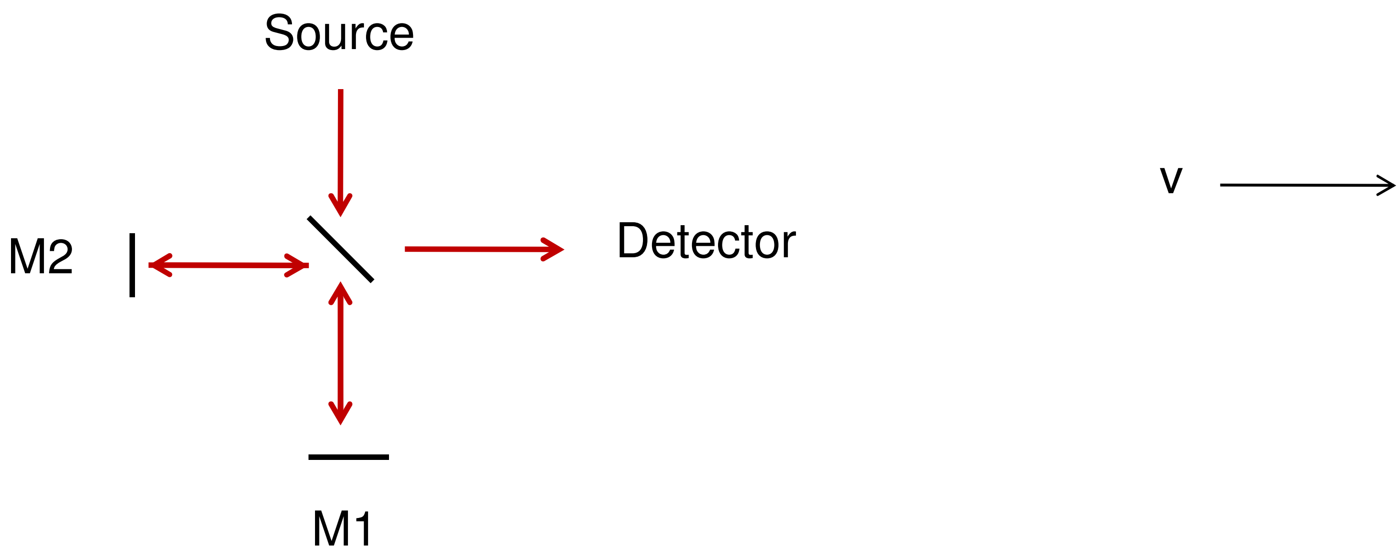


If a stationary ‘Ether’ existed, which path would take longer? The path lengths are equal.

a) Towards M1

b) Towards M2

But this is not easy to see intuitively



If a stationary ‘Ether’ existed and the interferometer was balanced in one orientation and then rotated 90 degrees:

a) There would be no observable effect at the detector.

b) There would be fringes moving past a point at the detector.

1818: Light is a wave (Fresnel, Poisson Spot)

1821: Light must be completely transverse to explain observed polarization effects.

Light must be propagating in an “ether”

1864: Maxwell shows light is self propagating EM fields.

1887: Testing the ether theory: Michelson and Morley

1905: Special Theory of Relativity (Einstein)

http://en.wikipedia.org/wiki/History_of_special_relativity

Name	Year	Arm length (meters)	Fringe shift expected	Fringe shift measured	Experimental Resolution	Upper Limit on V_{aether}
Michelson	1881	1.2	0.04	0.02		
Michelson and Morley	1887	11.0	0.4	< 0.01		8 km/s
Morley and Miller	1902–1904	32.2	1.13	0.015		
Miller	1921	32.0	1.12	0.08		
Miller	1923–1924	32.0	1.12	0.03		
Miller (Sunlight)	1924	32.0	1.12	0.014		
Tomascheck (Starlight)	1924	8.6	0.3	0.02		
Miller	1925–1926	32.0	1.12	0.088		
Kennedy (Mt Wilson)	1926	2.0	0.07	0.002		
Illingworth	1927	2.0	0.07	0.0002	0.0006	1 km/s
Piccard and Stahel (Rigi)	1927	2.8	0.13	0.006		
Michelson et al.	1929	25.9	0.9	0.01		
Joos	1930	21.0	0.75	0.002		