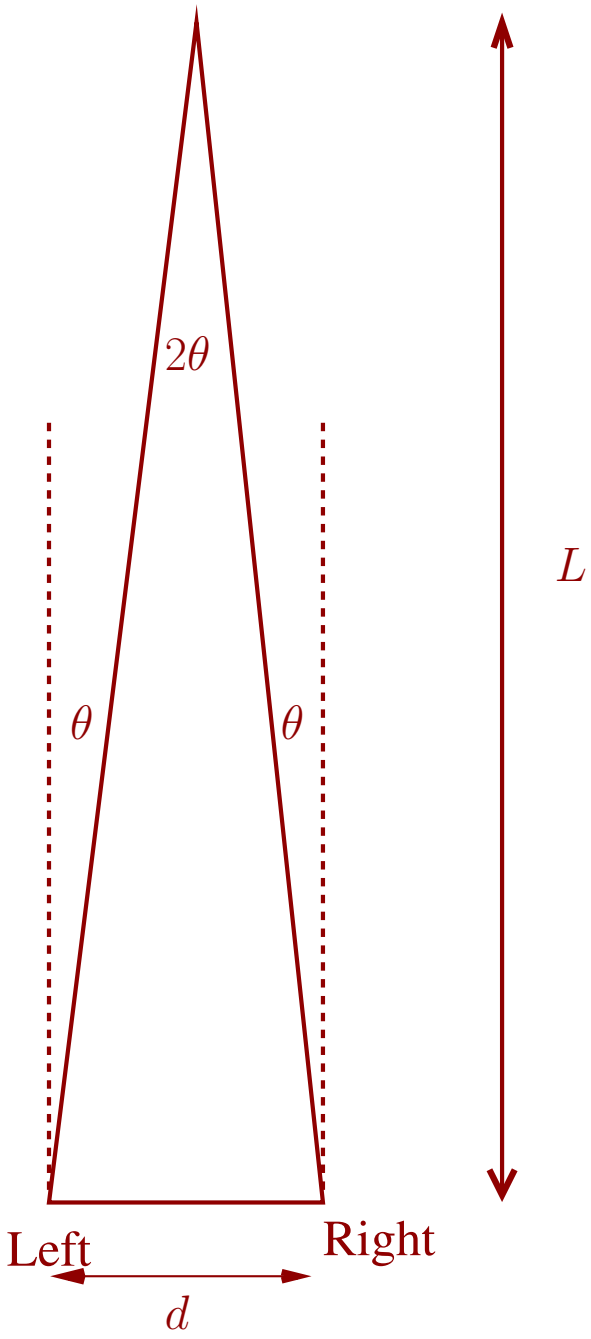
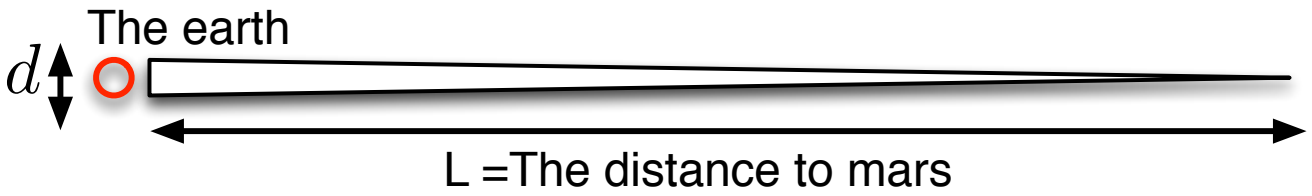
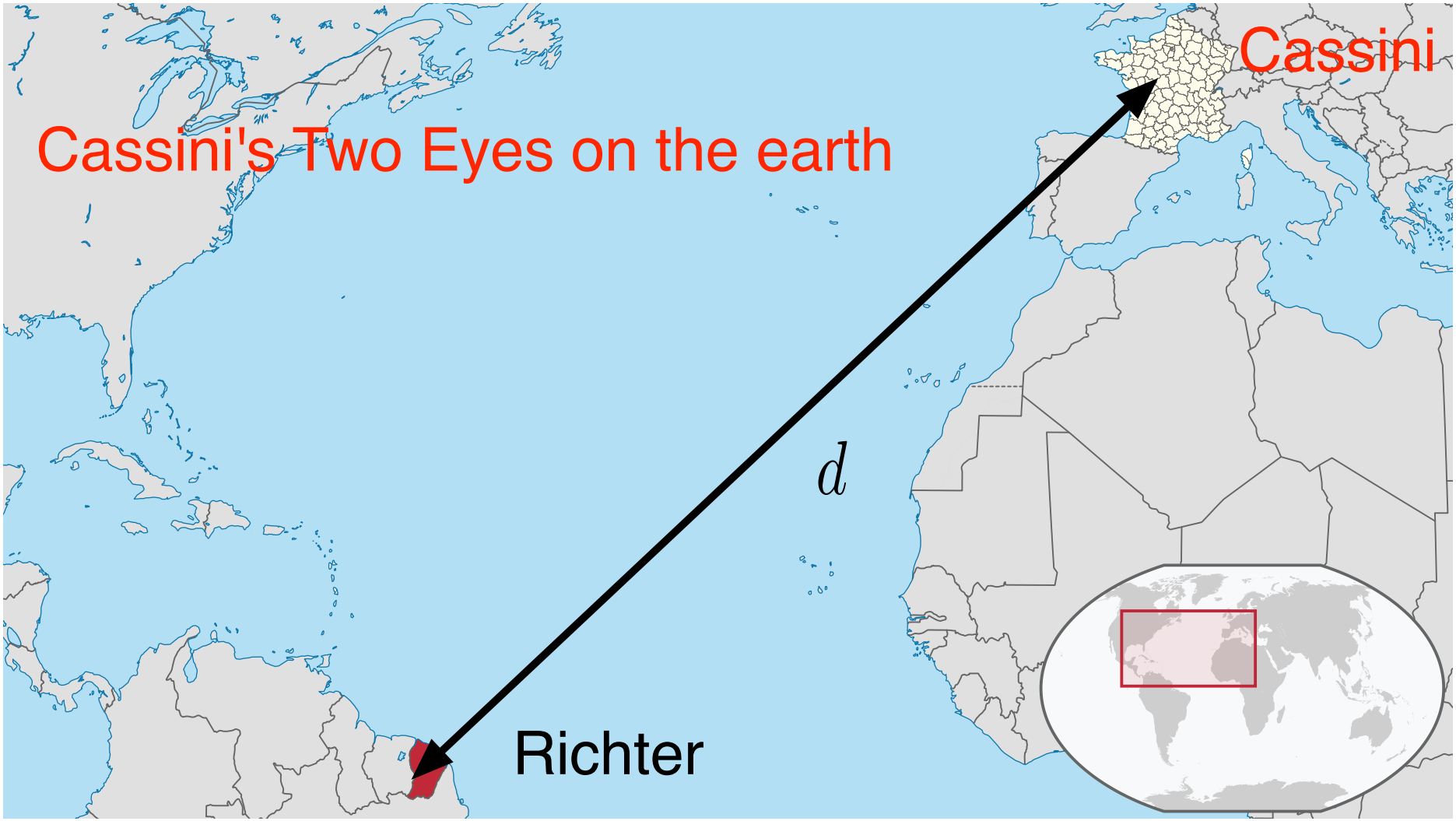

2θ
θ
θ
L
Left
Right
d

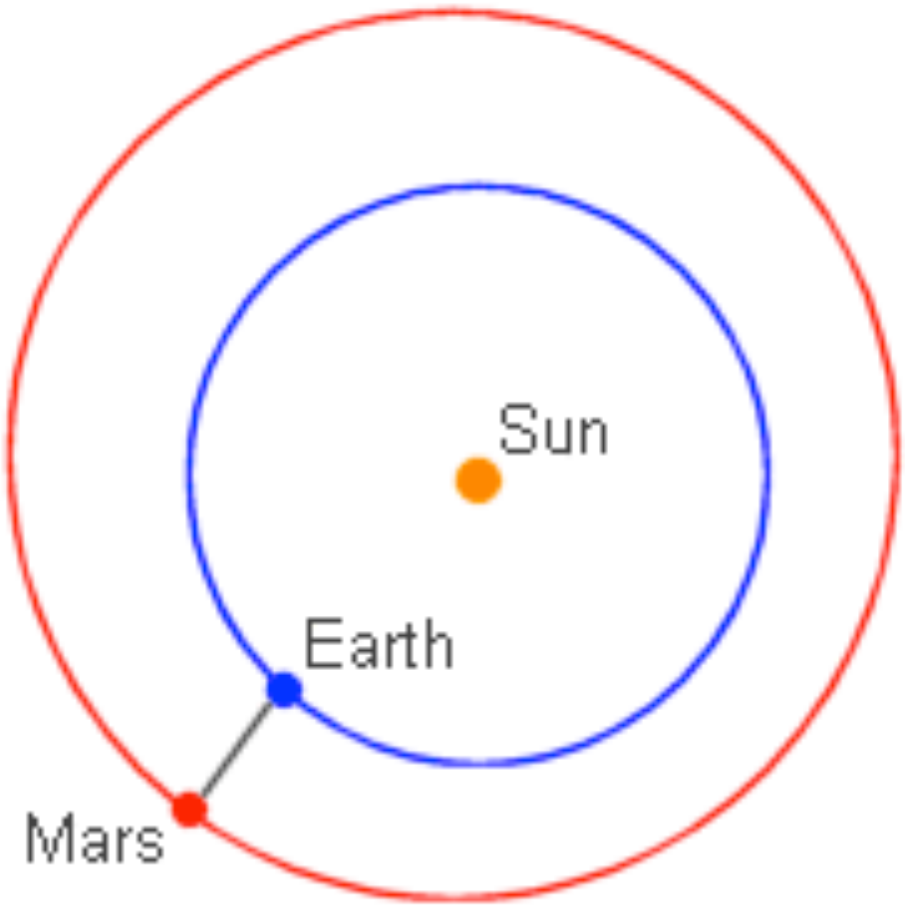
Cassini and Parallax



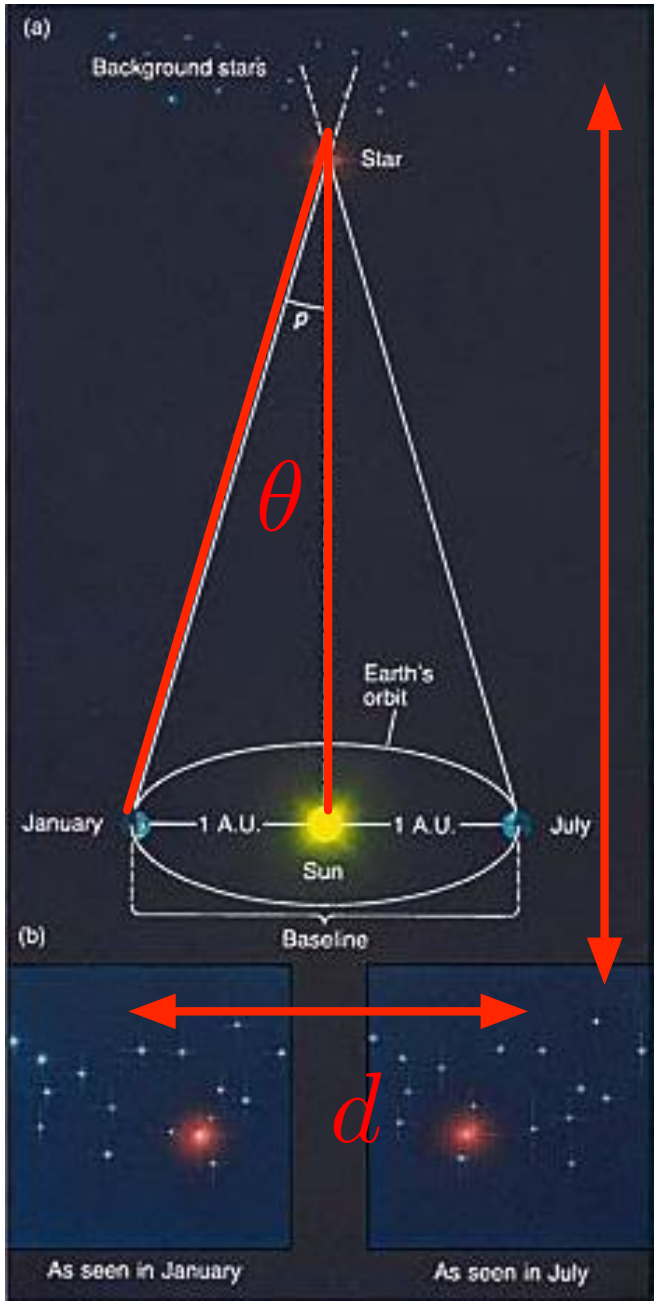
The earth is 200 times bigher than reality in this figure !


Cassini's Two Eyes on the earth
Cassini
d
Richter

Mars in opposition



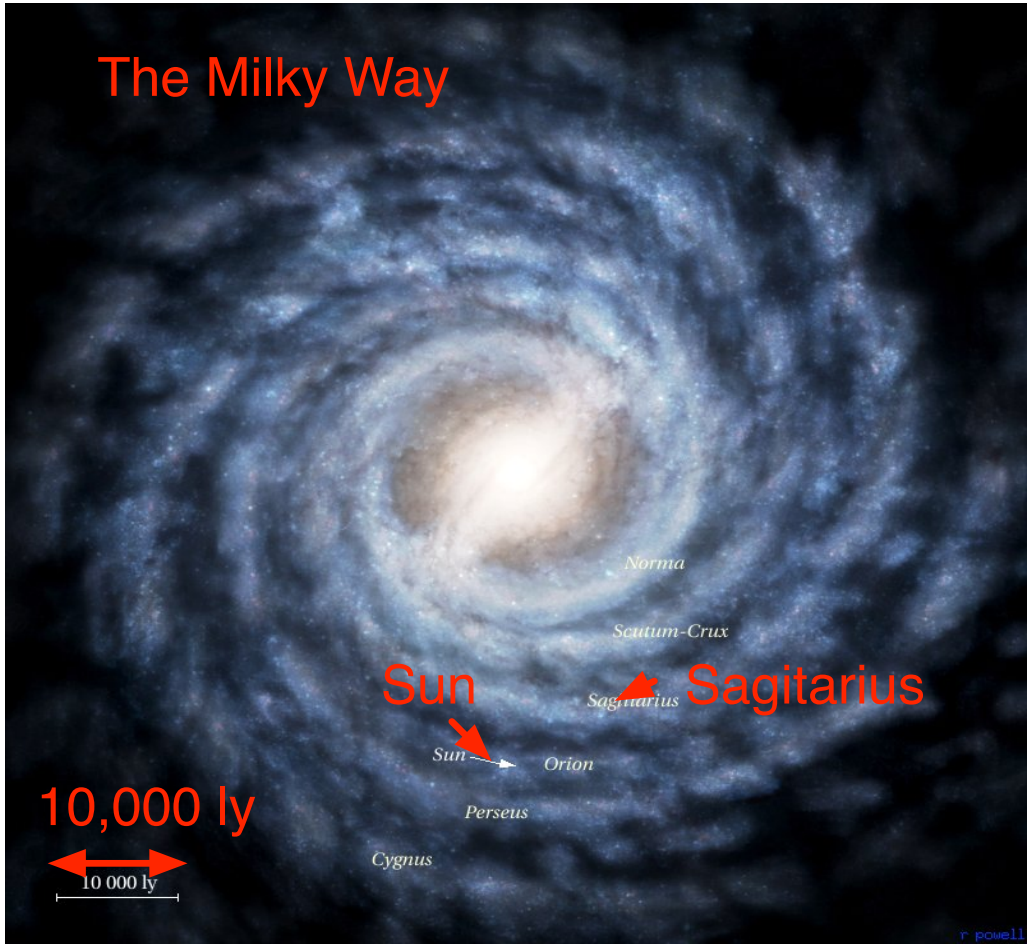
Mars at Opposition



$$L = \frac{1AU}{\theta}$$

Theta =1 arc sec then L=1 parsec

Bessel measured the angle to 61 Cygni to be 0.3 arcsec

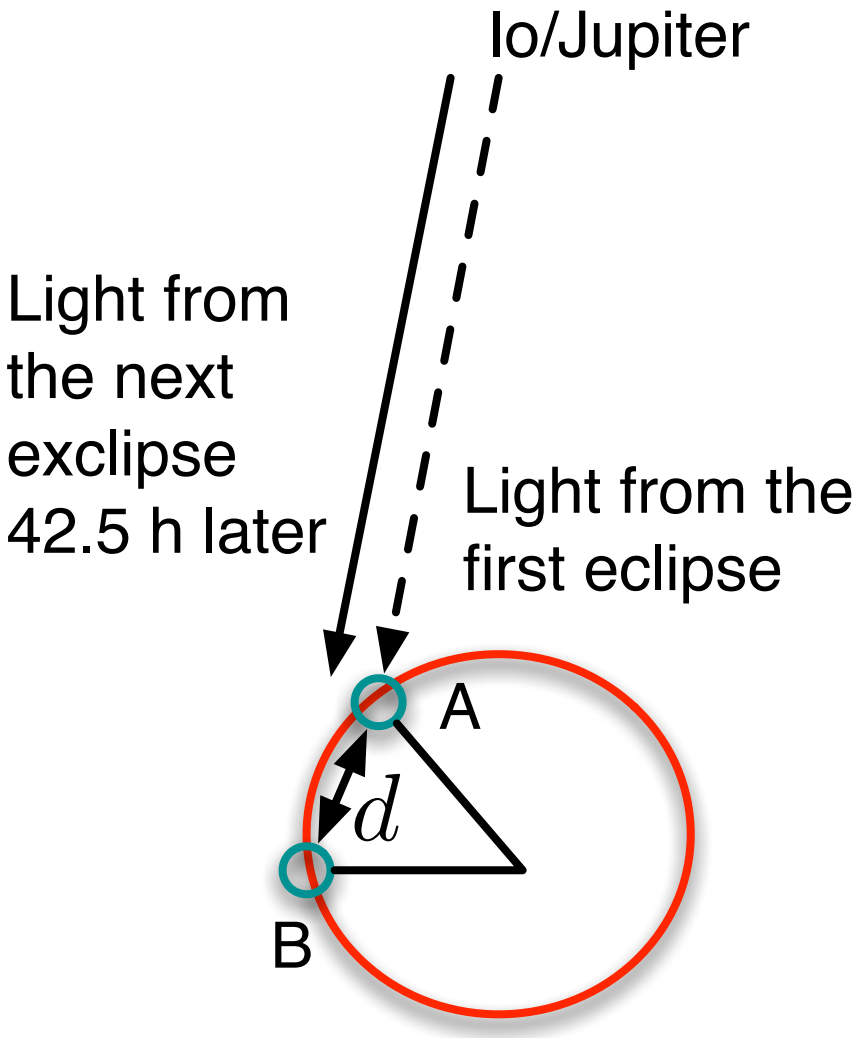


We are only measuring a the very nearest stars with Parallax

The GAIA 2013 mission can help and measure the distances up to 10,000 ly ! By measuring angles to one part in 10^7

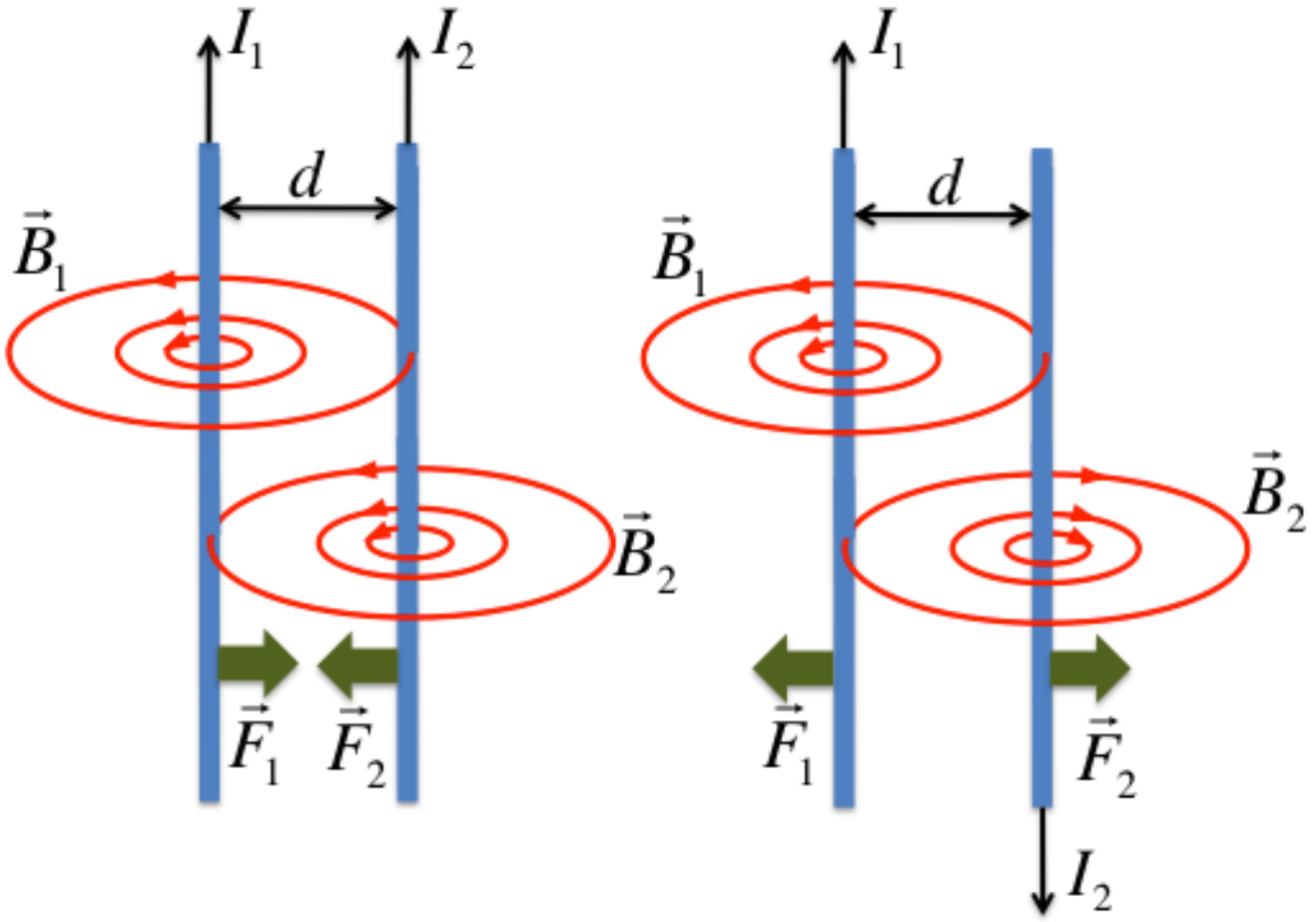
- Do the homework in Groups Hand in one paper

Measuring the speed of Light: Ole Roemmer – 1672



Same charges repel

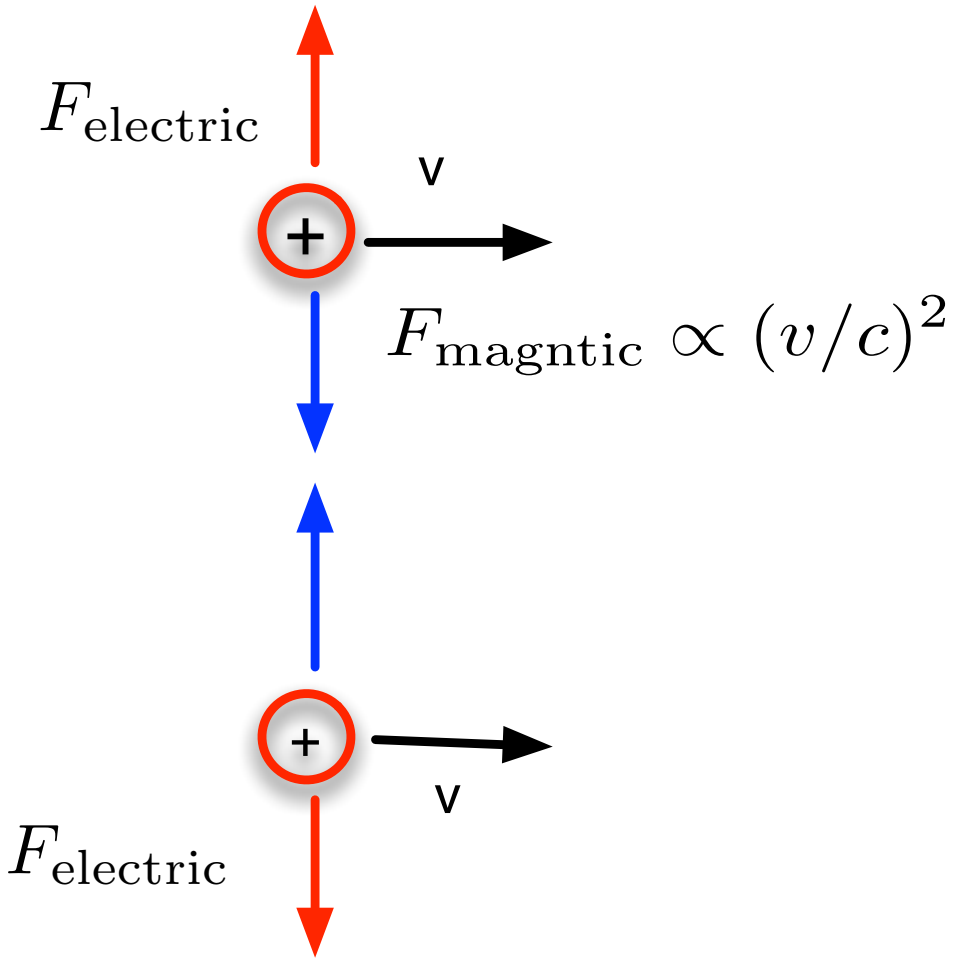
- Wires attracting and repelling see this You Tube Video



Find that the force is proportional to the products of currents:

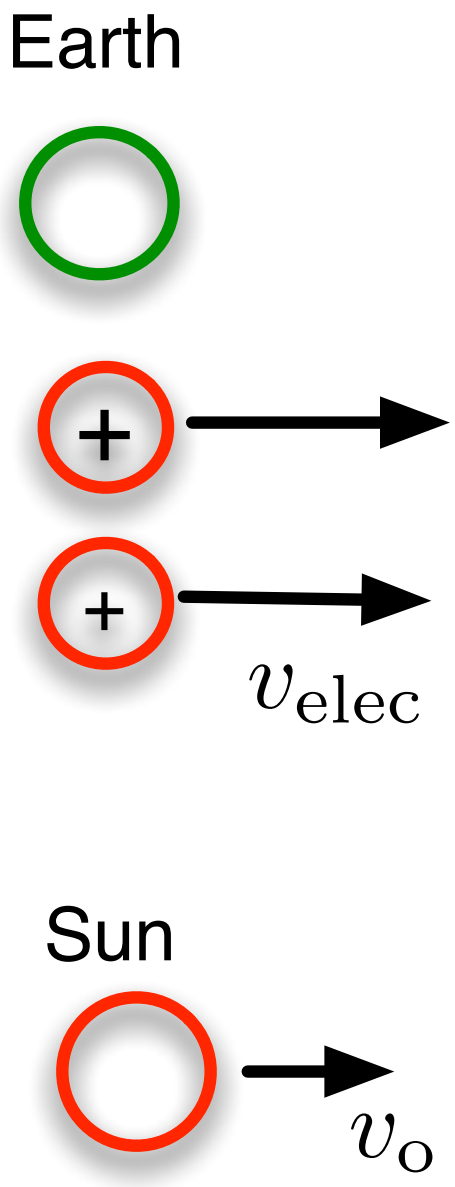
$$F \propto I_1 I_2$$

So two charges moving experience an electric and magnetic force

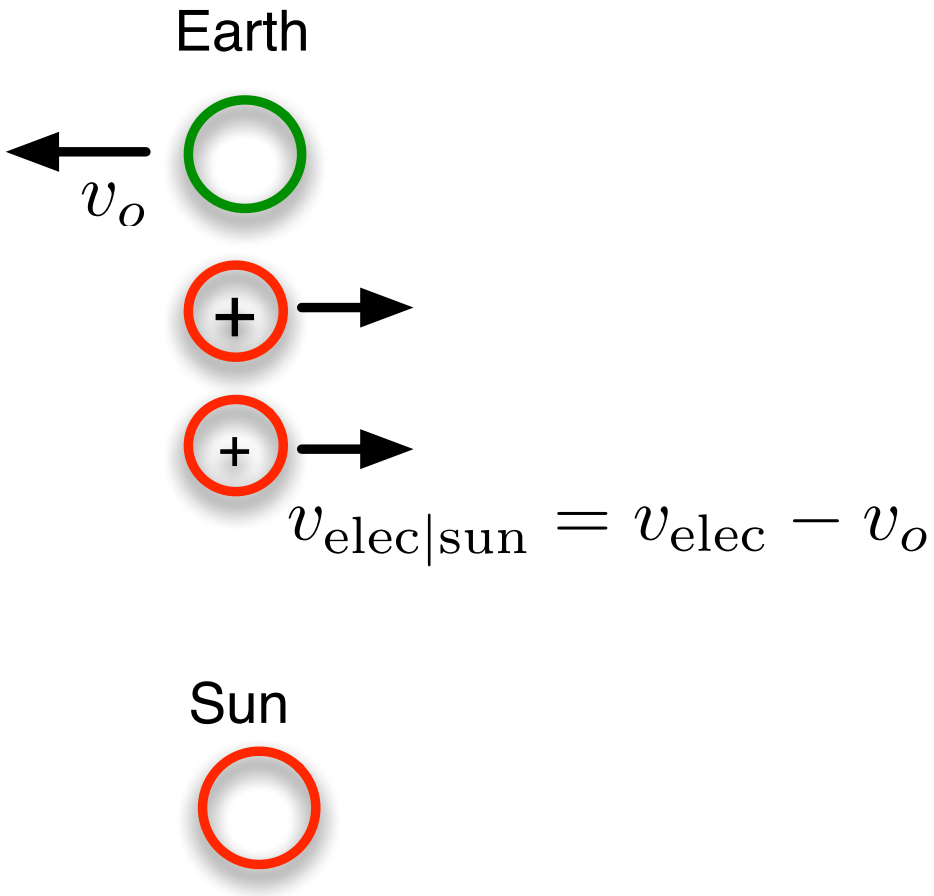


What is the velocity that determines the force

Which velocity to take ? The earth sees



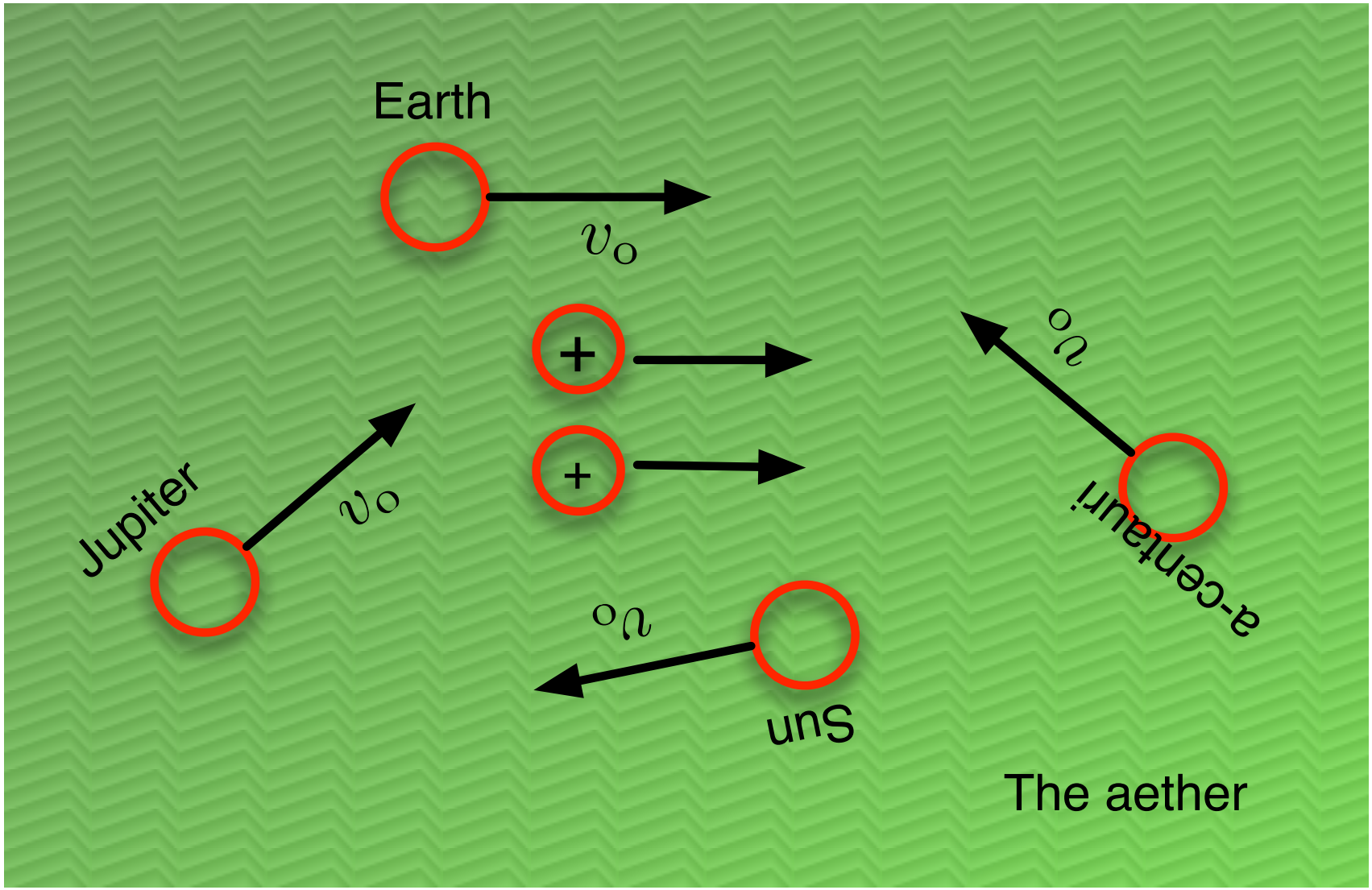
Which velocity to take ? The sun sees

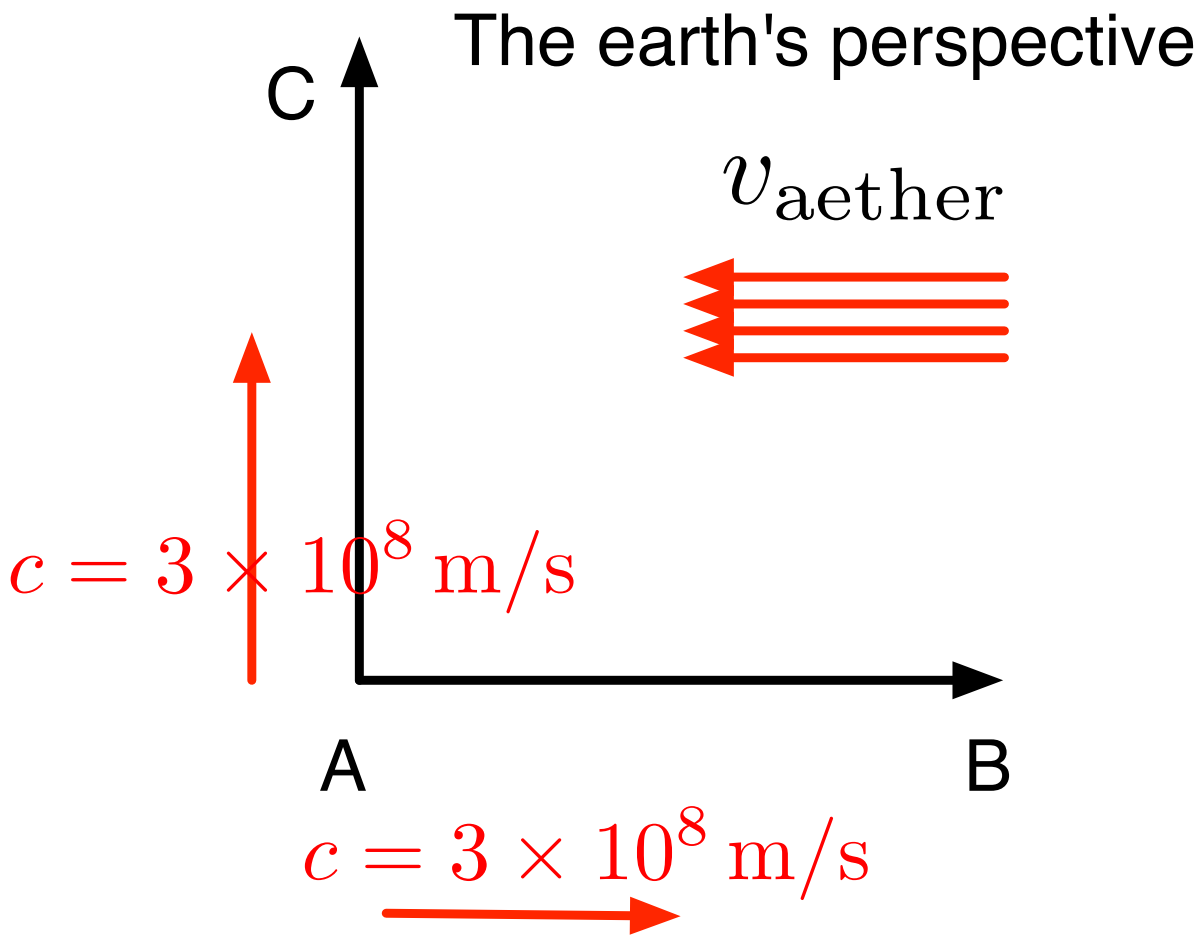


Should I take v_{elec} (the electron velocity measured by earth) or $v_{\mathrm{elec|sun}}$ (the electron velocity measured by sun)

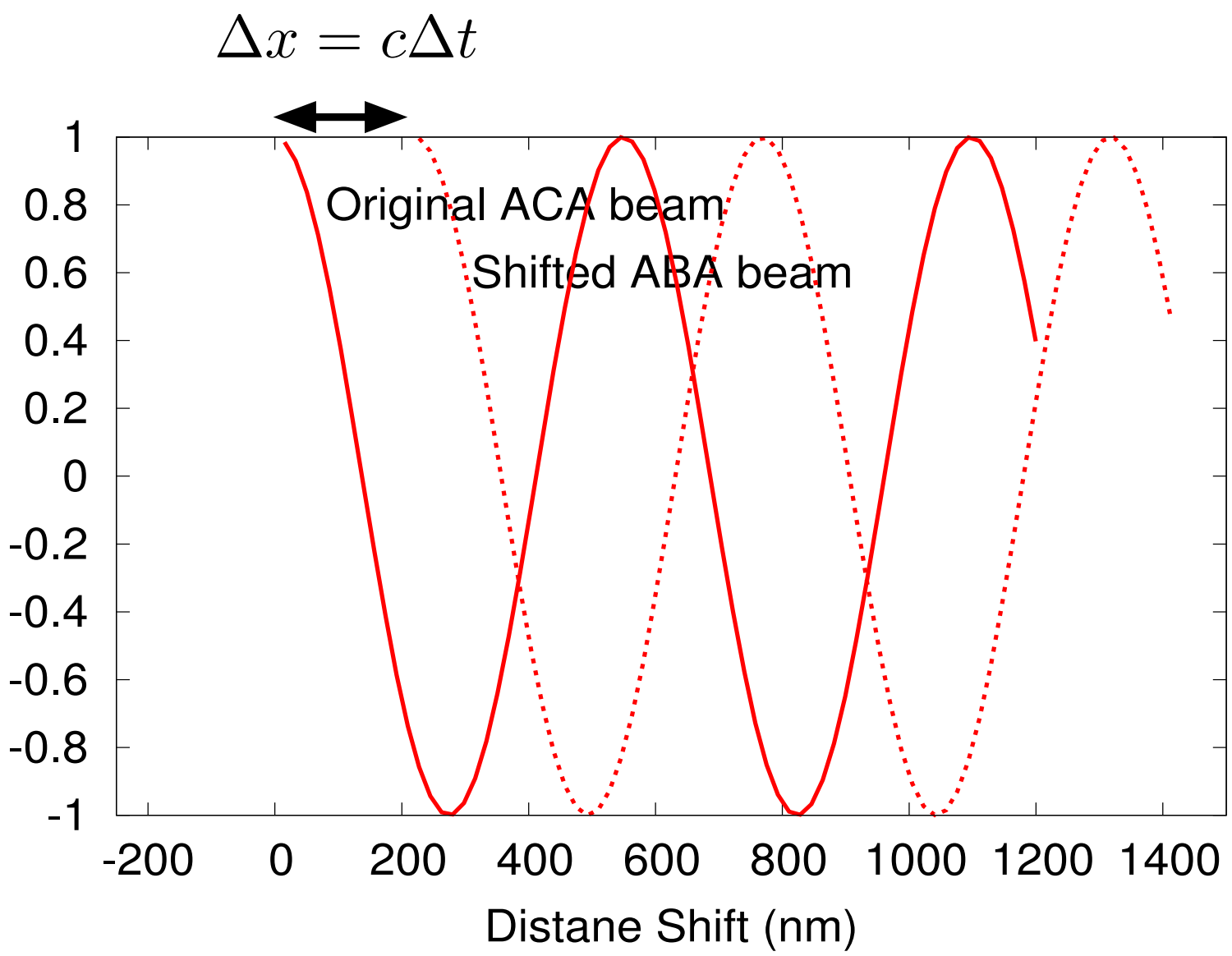
19th century (incorrect) answer – the aether

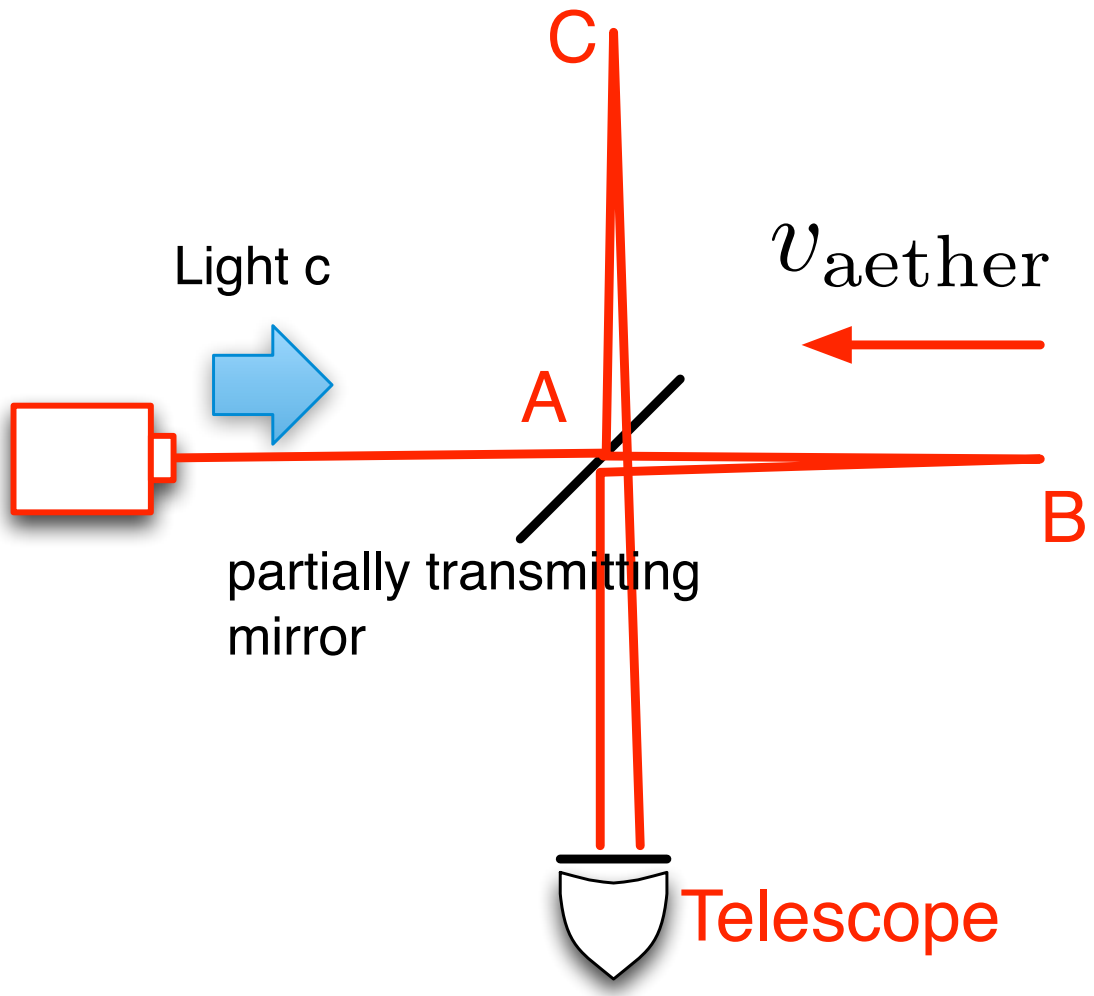
- Measure the electron velocity (and all others) relative to the light medium



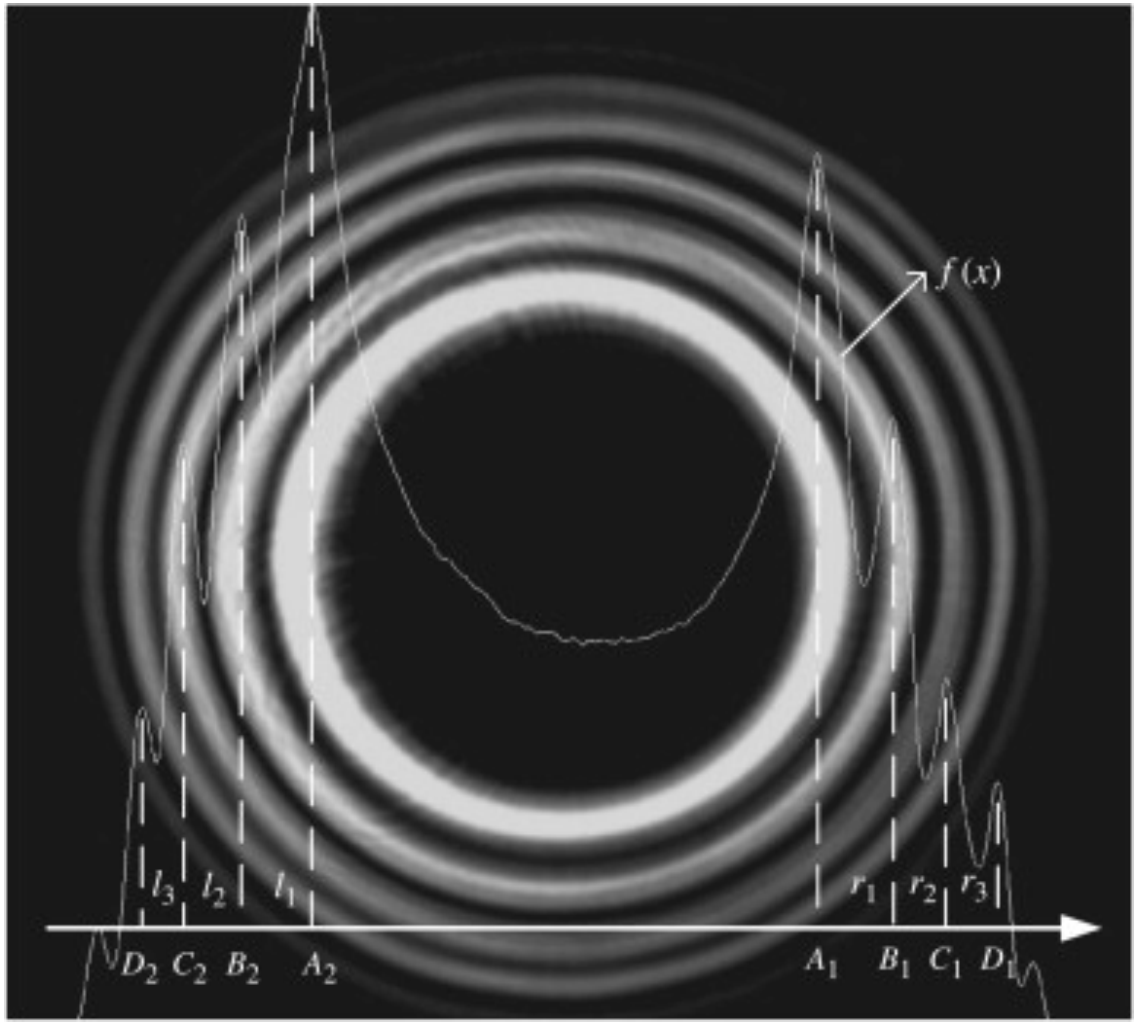


The distances are equal AC = AB = L


$\Delta x = c\Delta t$
Original ACA beam
Shifted ABA beam
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
-200
0
200
400
600
800
1000
1200
1400
Distane Shift (nm)

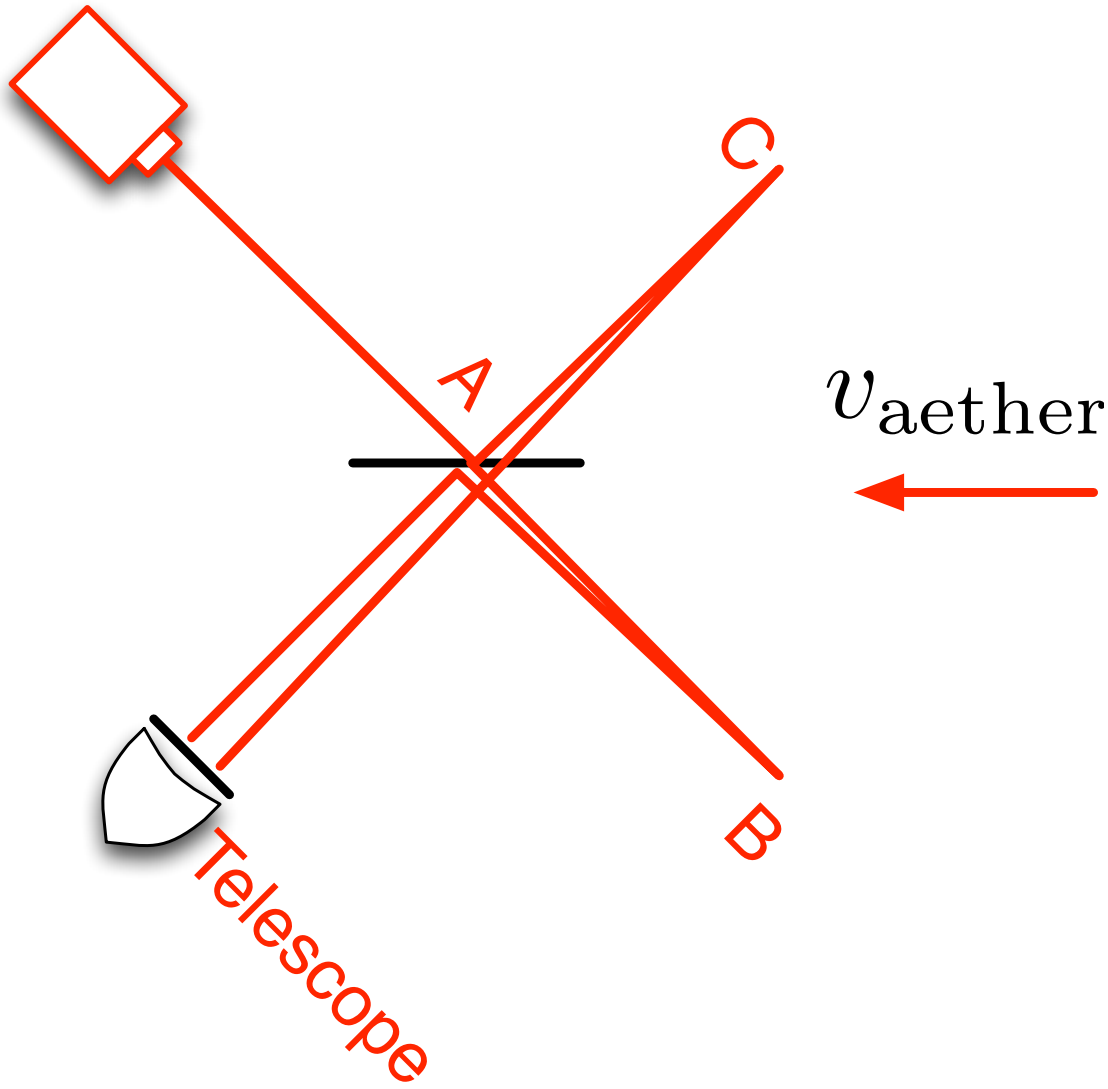

C
Light c
v_{aether}
A
B
partially transmitting
mirror
Telescope

The two light beams out of phase interfere

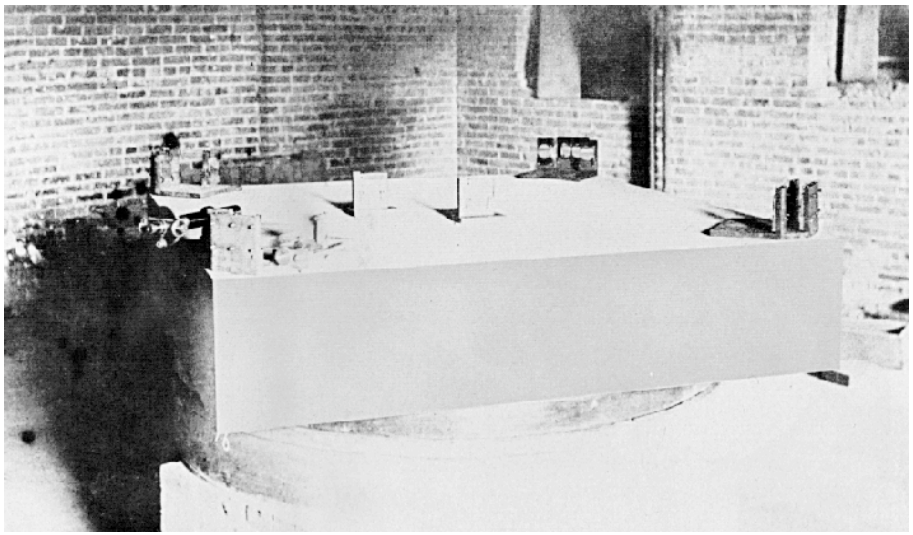


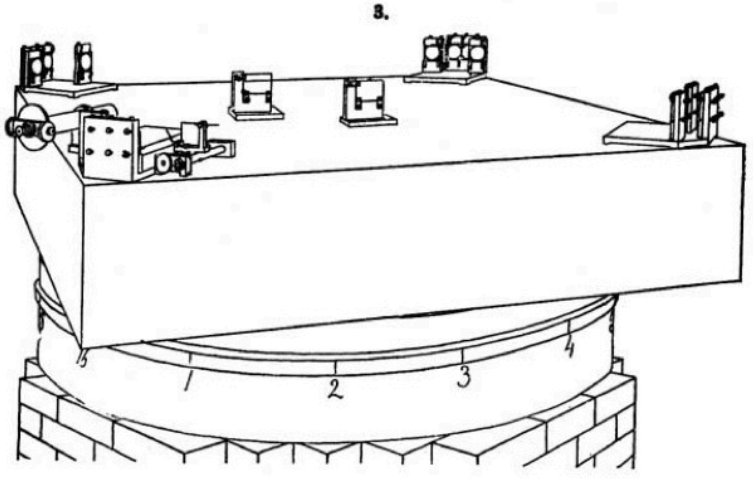
When rotate the interferometer the effect due to the aether is the same in both arms.

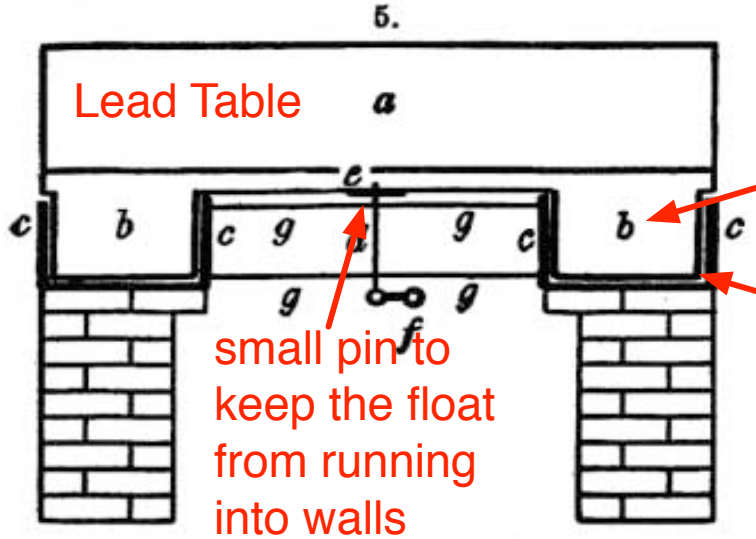
There is no time difference



The real michelson experiment







Michelson turned the table and saw that *nothing* changed when rotating the table!