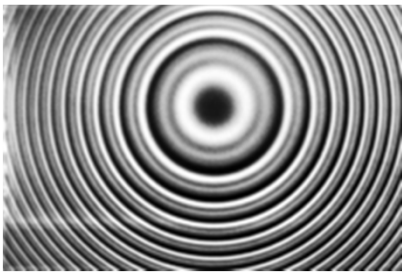


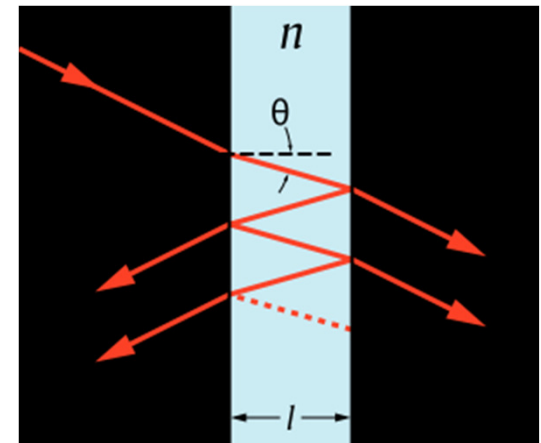
Hydrogen Alpha Solar Filters

- The Fabry-Perot Etalon used in today's Hydrogen Alpha solar scopes was invented in 1899 by Charles Fabry and Alfred Perot.
 - “Etalon” is taken from the French *etalon*, meaning “measuring gauge” or “standard”



Interference fringes from a Fabry-Pérot etalon

- Typically the etalon consists of a transparent plate with two reflecting surfaces that exhibit multiple peaks of transmission corresponding to the resonance of the etalon
- Etalons are used in lasers, spectroscopy and telecommunications to control and measure the wavelengths of light
- Recent advances in fabrication techniques have allowed the creation of very precise **tunable** Fabry-Pérot interferometers.



A Fabry-Pérot etalon. Light enters the etalon and undergoes multiple internal reflections.

Source: Wikipedia.com

Hydrogen Alpha Telescope Components

- The first thing a light ray encounters in a Hydrogen Alpha solar telescope is an **energy rejection filter** or **ERF**
 - **The ERF blocks unwanted ultraviolet and infrared wavelengths**
- The next component, the **telescope objective**, focuses the Sun's light
- After light passes through the telescope in a rear mounted design, it must be straightened prior to striking the etalon by a **telecentric** component, which acts like a Barlow lens
- The key component, the **etalon** produces a “comb-like” filtering effect on the incoming light, allowing only multiples of a certain frequency to pass
- The etalon has a **tuning mechanism** to allow slight frequency shifts
- A final **blocking filter** removes all of the remaining frequency peaks except the desired Ha frequency
 - The blocking filter also attenuates incoming amplitude
- As with all telescopes, the **eyepiece** magnifies the solar image
 - Contrary to advertising claims, special eyepieces are not needed!

