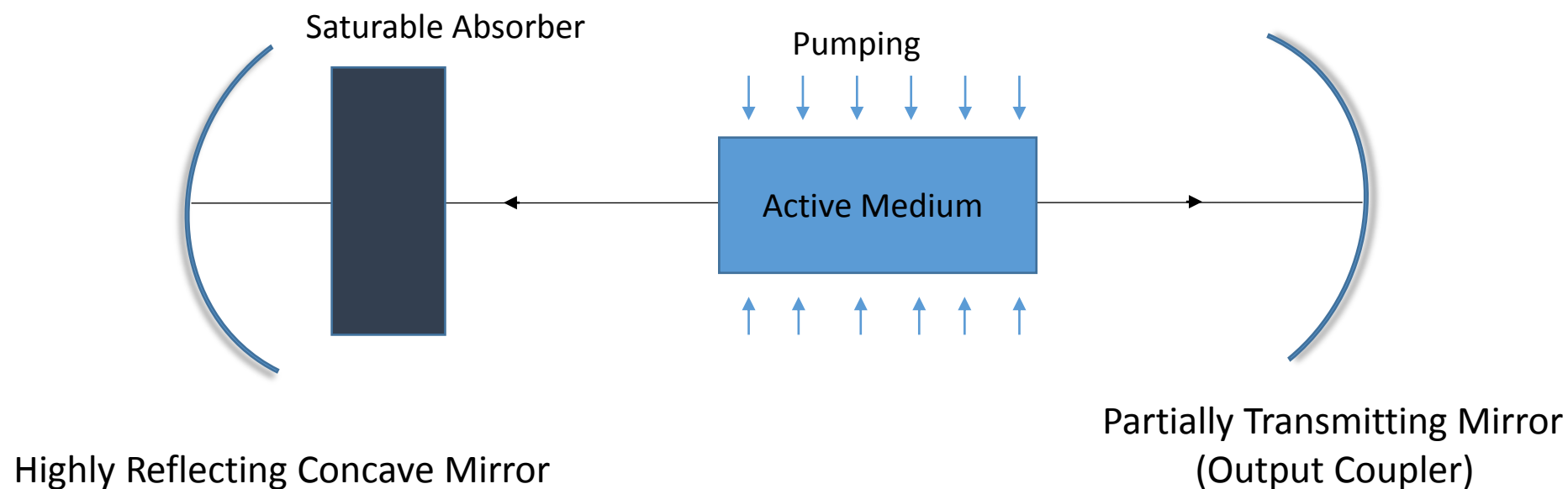


# Q-Switching

Q-Switching can be classified as :-

- **Active Q-Switching** involves Pockels cell and quarter wave plate as discussed earlier. This arrangement need to be synchronized with the population inversion.
- **Passive Q-Switching** is automatically synchronized technique. It involves a saturable absorber which has strong absorption at the frequency of emission of active medium.

# Passive Q-Switching



**Schematic diagram of Passive Q-Switching**

# Comparison of Cavity Dumping and Q-Switching

- Q-switching involves blocking the oscillations so cavity can't work as optical resonator while in case of cavity dumping oscillations are not blocked.
- Q-Switching involves storage of energy in active medium while cavity dumping involves storage of energy within the cavity.

Both the techniques are limited to a minimum pulse width which is of the order of nanosecond. So, we switch to another technique which is called as Mode Locking. With this new technique we can get ultrashort pulses which have time scale of the order of picosecond( $10^{-12}$ s) to femtosecond( $10^{-15}$ s).