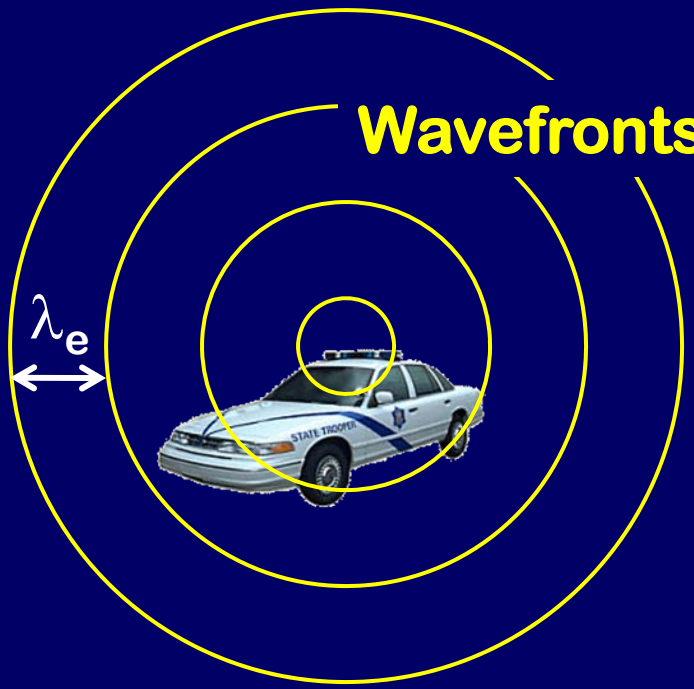
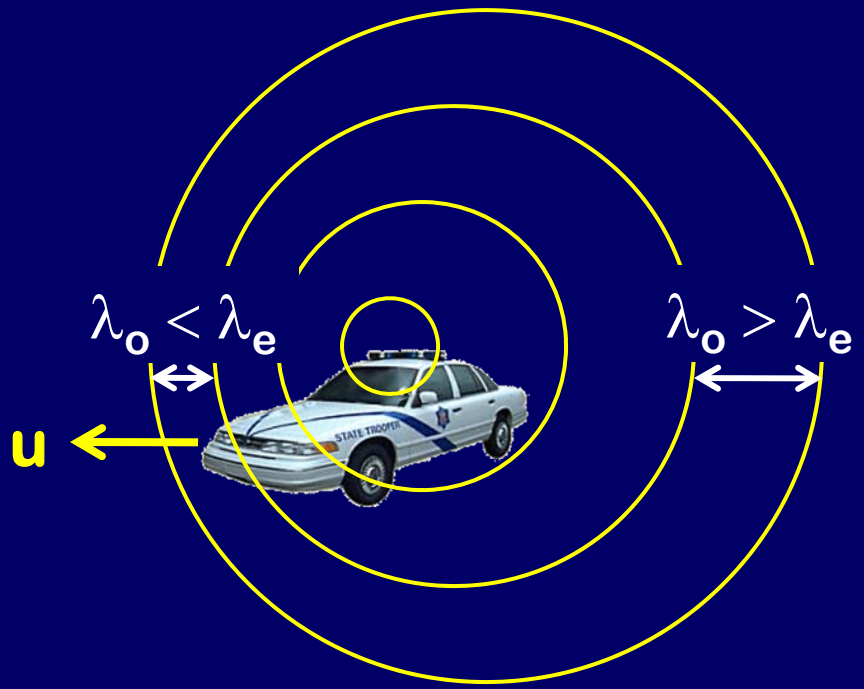
Doppler Effect

A police car emits light of wavelength λ_e



Now the car is moving to the left. Observed wavelength λ_o different!



Moving toward observer: $f_o = f_e(1 + u/c)$

Moving away from observer: $f_o = f_e(1 - u/c)$

$\lambda = f/c$

Only relative velocity matters:

$u = v_1 + v_2$ moving in opposite directions

$u = v_1 - v_2$ moving in same direction