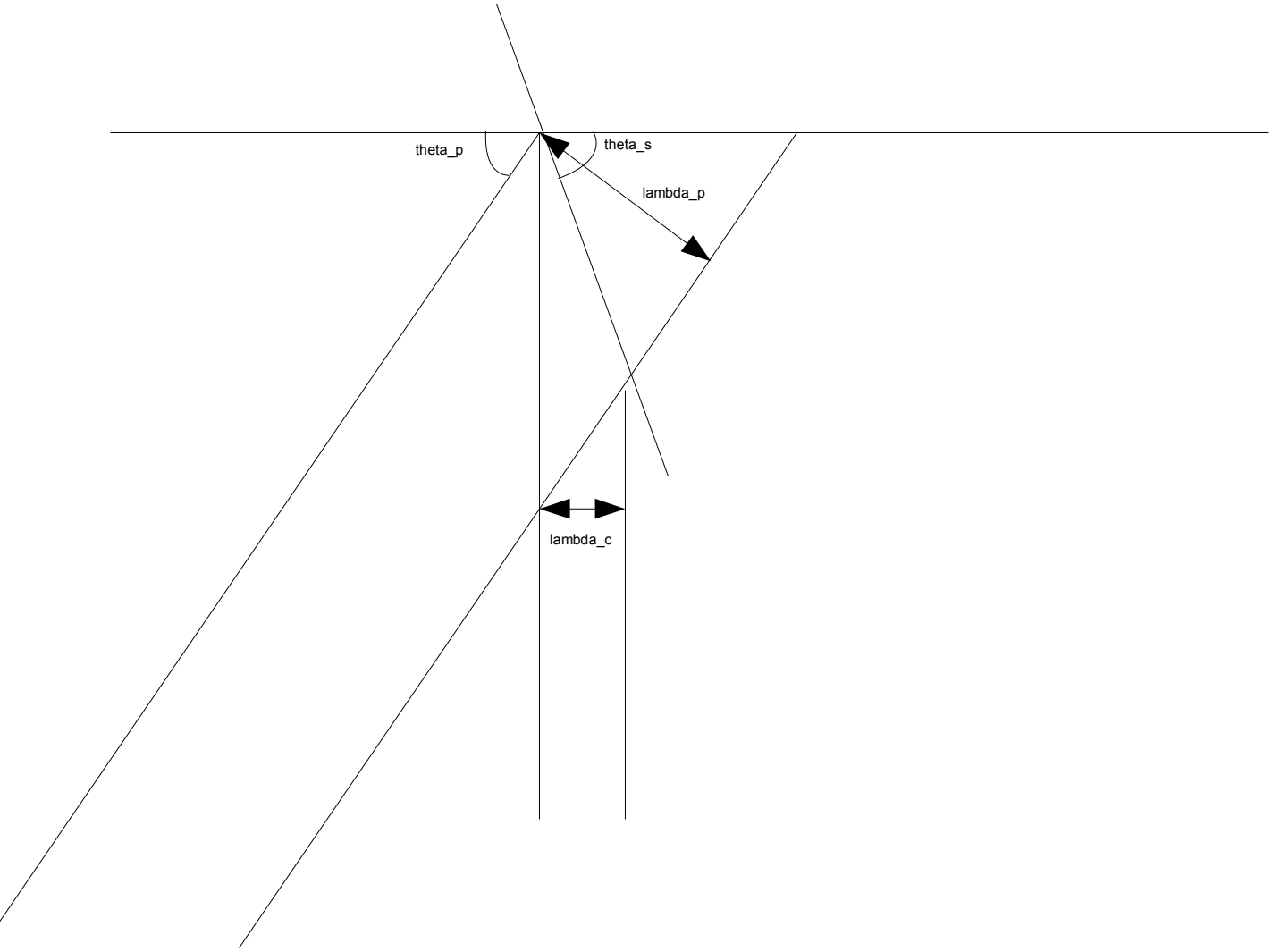
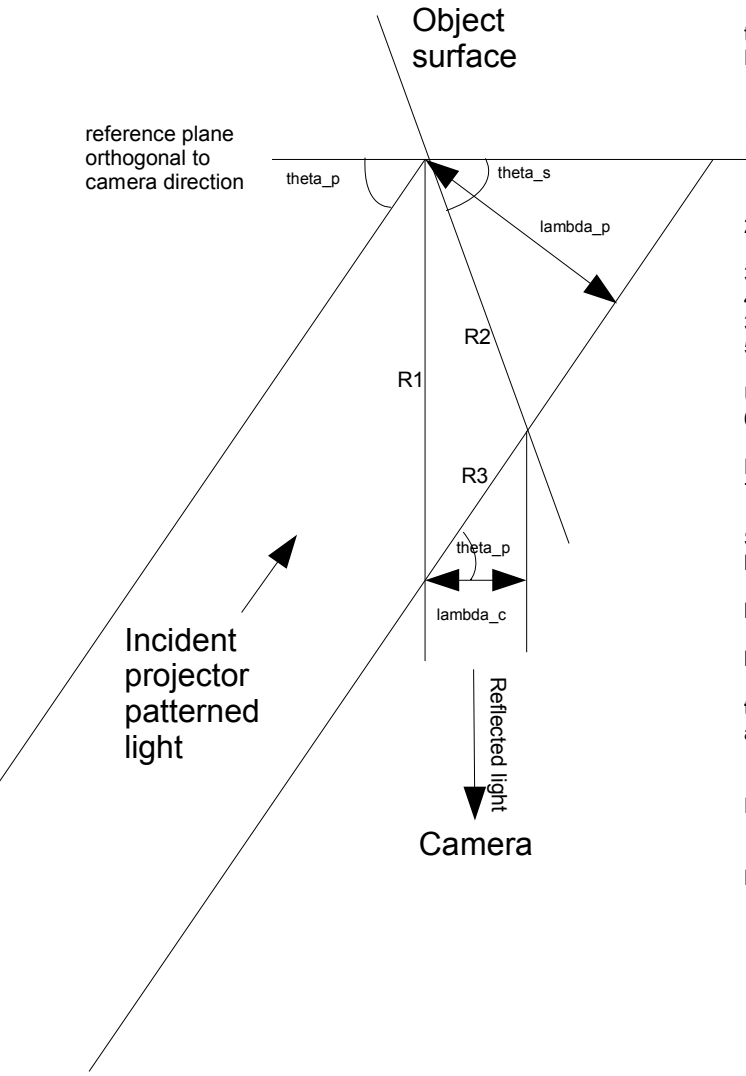

theta_p
theta_s
lambda_p
lambda_c



theta_p, lambda_p, and lambda_c are known,
R1-3, theta_s is unknown.

1. R3 = R1 cos(90-theta_p) – R2 cos(180-(theta_s+theta_p))
1b. R3 = R1 sin(theta_p) + R2 cos(theta_s+theta_p)

2. lambda_c = R3 cos (theta_p)

3. lambda_p = R1 sin (90-theta_p) = R1 cos(theta_p)
4. R1 = lambda_p/(cos(theta_p))
3b. lambda_p = R2 sin(theta_s + theta_p)
5. R2 = = lambda_p/(sin(theta_s+theta_p))

Use 4 and 5 in 1:
6. R3 = lambda_p(tan(90-theta_p) + 1/tan(theta_s+theta_p))

Put 6 in 2:
7. lambda_c = lambda_p(tan(theta_p) + 1/tan(theta_s+theta_p)) cos(theta_p)

Solve for theta_s:
lambda_c/cos(theta_p) = lambda_p*tan(theta_p) + lambda_p/tan(theta_s+theta_p)

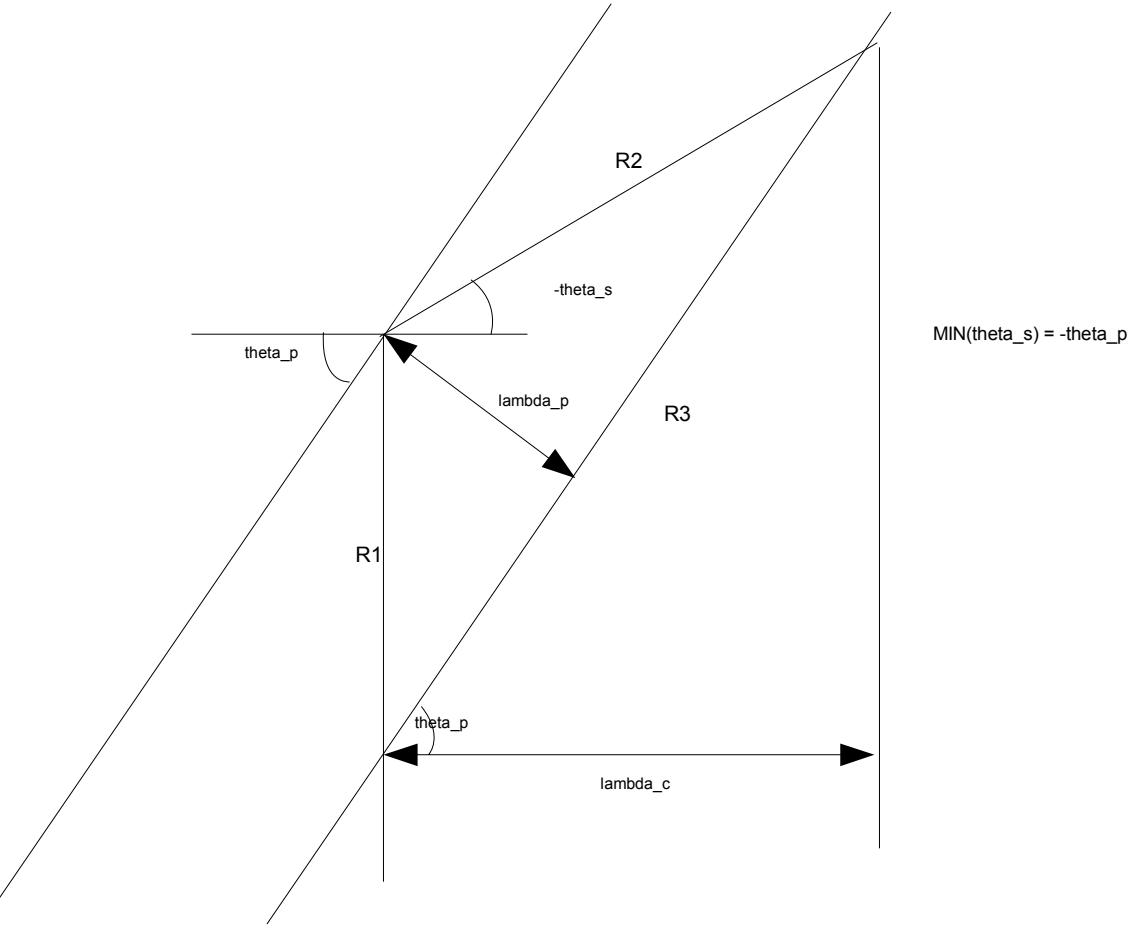
lambda_p/tan(theta_s+theta_p) = - lambda_p*tan(theta_p) + lambda_c/cos(theta_p)

lambda_p/(- lambda_p*tan(theta_p) + lambda_c/cos(theta_p)) = tan(theta_s+theta_p)

theta_s =
atan(lambda_p/(lambda_c/cos(theta_p)) - lambda_p*tan(theta_p)) - theta_p

R2 cos(theta_s) = lambda_c → would using this simplify the equation?

MAX theta_s = 90 degrees



MIN(theta_s) = -theta_p