the coverage area of the AND rule \((A^c_e)\) is larger. On the other hand, as the distance is increased, there is a distance where the two circles become disjoint and coverage area of the pair becomes zero, while the coverage area of the pair that uses the OR rule achieves its maximum equal to \(2A^v_e\). In fact, there exists a distance \(\overline{d}\) where the two fusion rules have identical performance. For \(d < \overline{d}\) the AND rule achieves better coverage whereas for \(d > \overline{d}\) the OR rule becomes superior.

**B. CD**

![CD coverage area](image)

According to (28) and (23) and given the threshold \(\gamma_c\), the perimeter of the coverage area by the two sensors is given by

\[
\sigma^2_S e^{-\left(\frac{r}{\lambda_v} + \frac{d}{\lambda_c}\right)} = \gamma_c.
\]

where \(r = r_1 + r_2\). Note that it is necessary that \(\sigma^2_S > \gamma_c\) since \(e^{-\left(\frac{r}{\lambda_v} + \frac{d}{\lambda_c}\right)} \leq 1\) for any \(r, d \geq 0, \lambda_v, \lambda_c > 0\). Taking logarithms on both sides and rearranging terms,

\[
r = \lambda_c \left( \ln \frac{\sigma^2_S}{\gamma_c} - \frac{d}{\lambda_c} \right) = 2a
\]