**The hyperbolic equation (in TDoA):**

Δd = dXA – dXB

= c(tA – tB)

= c[(tA - tStart) – (tB - tStart)]

= c(tXA - tXB) (1)

*tA: Time that signal arrived at A*

*tB: Time that signal arrived at B*

*tStart: Time that signal has been send from X*

**In Round-trip Time of Flight case:**

*t1: Time delay between the MCU at A start timer and signal is in the air*

*t2: Time delay when MCU at X echo the signal*

*t3: Time delay between signal is in the air and the MCU at A stop timer*

ΔtA = Timer stop – Timer start

= t1 + tAX + t2 + tXA + t3

Suppose tAX = tXA 🡪 = tXA + 

🡪 tXA=-=-(2)

*(with =t1+t2+t3)*

Apply (2) to (1):

Δd=c[tXA-tXB]=c[(-)-(-)]

We have tprocessA = tprocessB, because of the similarity of hardware, then:

Δd=(ΔtA - ΔtB)

In conclusion, we can draw a TDoA-like-hyperbolic by the result of RToF. The advantage of this approach is requiring no time synchronization and remove hardware delay time in RToF.