

then by using pythagoras it can be inferred that

$$(t_g v_a)^2 + (t_0 v_i)^2 = (T - t_0)^2 v_a^2$$

This is a quadratic equation in  $t_0$ , the unknown travel time element from the diffraction point, of the form

$$a(t_0)^2 + bt_0 + c = 0$$

whose coefficients are

$$a = \left( \frac{v_i^2}{v_a^2} \right) - 1$$

$$b = 2T$$

$$c = (t_g^2 - T^2)$$

The equation can be solved for  $t_0$  and the offset distance calculated ( $t_0 v_i$ ).