2.3. *Home and comoving frames' shared space and time dispersals*

For any fixed $v = \tanh(\tau_f \alpha_f) = \tanh \underline{\tau}$, $\gamma = \cosh \underline{\tau}$, $v\gamma = \sinh \underline{\tau}$, (6) and (12) yield the rockets' HOME FRAME SHARED VELOCITY TIME AND DISTANCE DISPERSALS:

$$\Delta T \triangleq t_f - t_r = \sinh \underline{\tau}.(1 + KL) - \sinh \underline{\tau} = v\gamma(1 + KL) - v\gamma = v\gamma KL, \tag{16}$$

$$\Delta D \triangleq (L+x_f)-x_r = L+(\cosh \underline{\tau}-1).(1+KL)-(\cosh \underline{\tau}-1) = L(1+K(\gamma-1)). \tag{17}$$

Lorentz transformations yield COMOVING FRAME SHARED VELOCITY DISPERSALS:

$$\Delta\mathfrak{T} \triangleq \gamma\left[\Delta T - v\Delta D\right] = \gamma\left[v\gamma KL - vL(1 + K(\gamma - 1))\right] = -\gamma vL(1 - K), \tag{18}$$

$$\Delta\mathfrak{L} \triangleq \gamma\left[\Delta D - v\Delta T\right] = \gamma\left[L(1 + K(\gamma - 1)) - v^2 K\gamma L\right] = L\left[\gamma(1 - K) + K\right]. \tag{19}$$