

$$P_{k;T,R}(X_f,\tau)=\frac{\int_{-\infty}^{\infty}dz\left|\Psi_{k;T,R}(X_f,z;\tau)\right|^2}{\int_0^{\infty}d\tau\int_{-\infty}^{\infty}dz\left|\Psi_{k;T,R}(X_f,z,\tau)\right|^2}$$