Text S3. Importance of DNAP parameters

Different parameters of nucleotide extension by DNAP can have a large effect on the shape of the time distribution at which nucleotides are written, even with the same mean replication rate. All three parameters ($\tau_c$, $\tau_p$, and $P$) affect the average speed with which DNA is replicated and thus the resulting misincorporation probabilities (Fig. S6A&D). Moreover, they each have different effects on the shape of the distribution, $\gamma_i(t;\theta)$. Longer regular extension durations ($\tau_c$) primarily shift the distribution to the right. Longer pauses ($\tau_p$) lead to a distribution with longer tails on the right hand side (Fig. S6B, green). The proportion of pauses ($P$) scales the weight of the tails (Fig. S6B, red). Thus, the specific, in vivo, dynamics of the polymerase can have profound implications on our ability to decode molecular ticker tapes. Fortunately, if a known signal can be applied, the molecular ticker tapes can be used to measure the behavior of the polymerase itself.