In Reliable, the delay may be cho en

to the number of u er . In th

round with few arrival (low traffi

Our conclu ion i t

way. The time tamp that determine how long a me age hould be held by an S-G

A Method to ompute the anonymity of Reliable

To formalize the behavior of the mixe , we define:

- X_s : an incoming me age arriving at time s;
- Y_t : an outgoing me age leaving at time t;
- D : the amount of time a me age ha been delayed.

We know that the mixe delay the me age exponentially and we have et the mean to 1 hour: $D \sim \mathrm{exp}(1)$:

$$\begin{aligned}\mathrm{pdf}: f(d) &= e^{-d} \qquad \text{for all } d \geq 0 \ ; \\ &= 0 \qquad \text{el ewhere} \ ; \\ \mathrm{cdf}: F(d) &= P(D \leq d) = 1 - e^{-d} \qquad \text{for all } d \geq 0 \ ; \\ &= 0 \qquad \text{el ewhere} \ .\end{aligned}$$

All delay time are independent.

rucial to note in thi etup i that the equence of outgoing me age i not a Poi on proce . Thi would only be true if all input would arrive at the ame time, hence belong to the mix when th

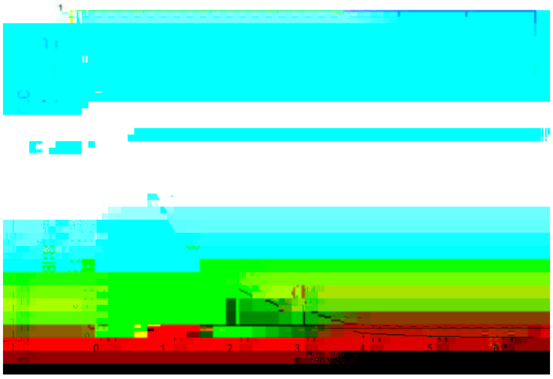

Fig. 9. An ex mple of n exponenti l prob bility density function

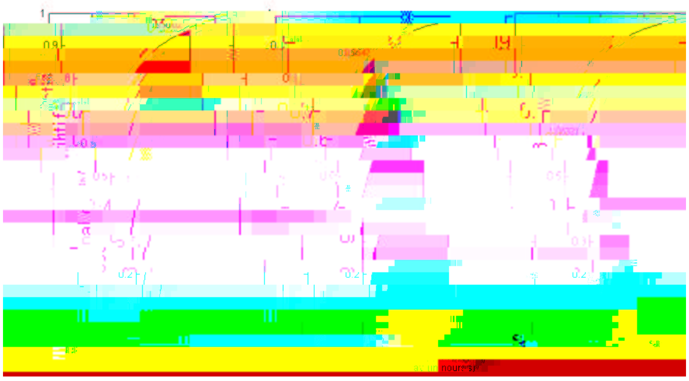

Fig. 10. he m tching exponenti l cumul tive density function

How can we then calculate the probabilitie of the delay time To make thi clear, let u look at Figure 9 and uppo e that we only have three arrival time prior to *out*. We have thu three po ible delay $d_1 > d_2 > d_3$. Let u now a ume for implicity rea on that $d_1 =$ hour , $d_2 = 2$ hour and $d_3 = 1$ hour. The variable delay i continuou and can theoretically take n ly va ue riv lt in Figure 10

[DDM03