



Harvest Imaging Forum 2022

Radiation Induced Defects and
Random Telegraph Signals in
CMOS Image Sensors

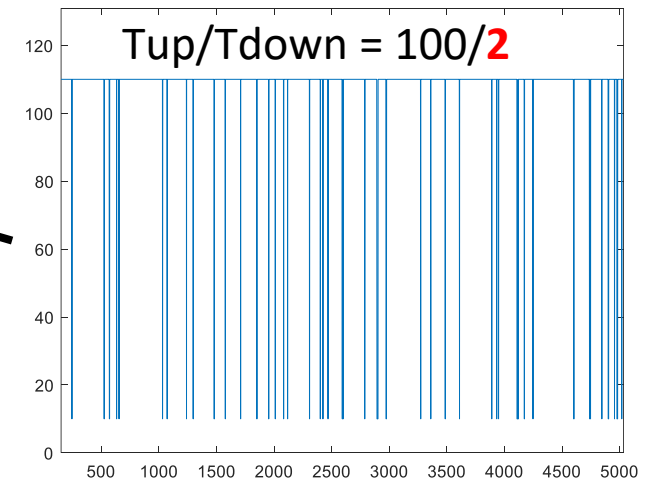
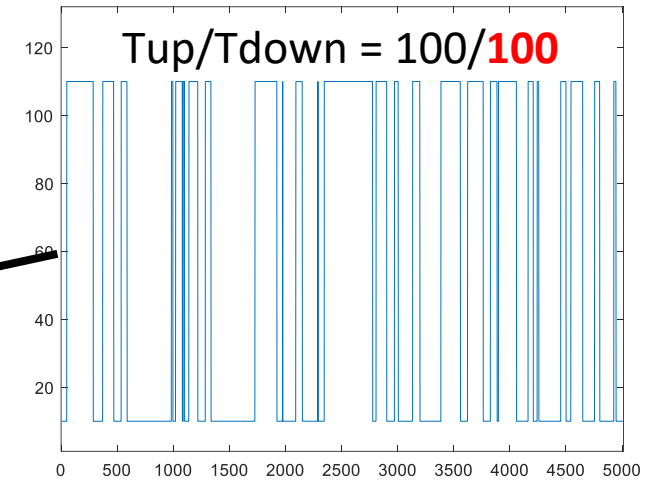
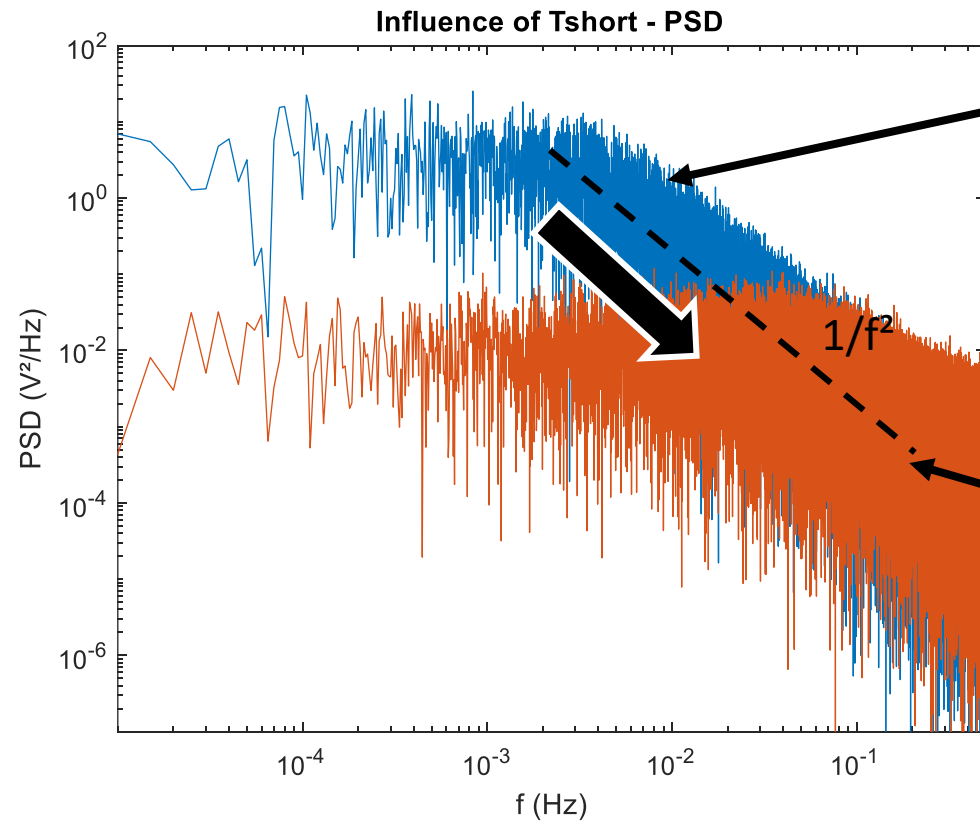
Vincent Goiffon

**RTS Spectrum
Simulations**

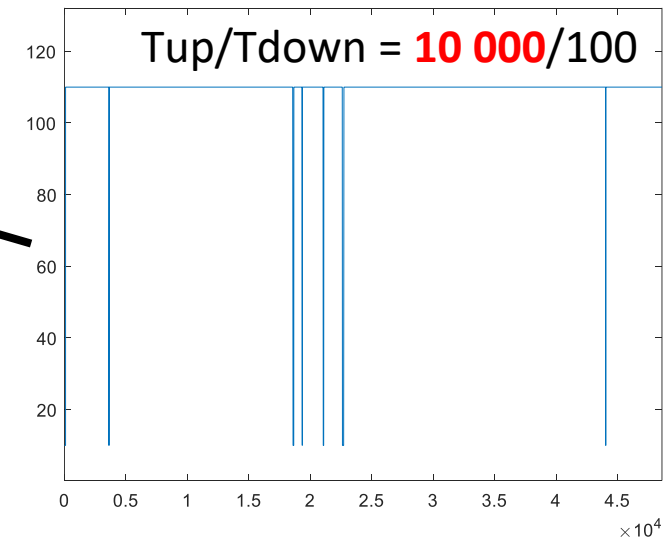
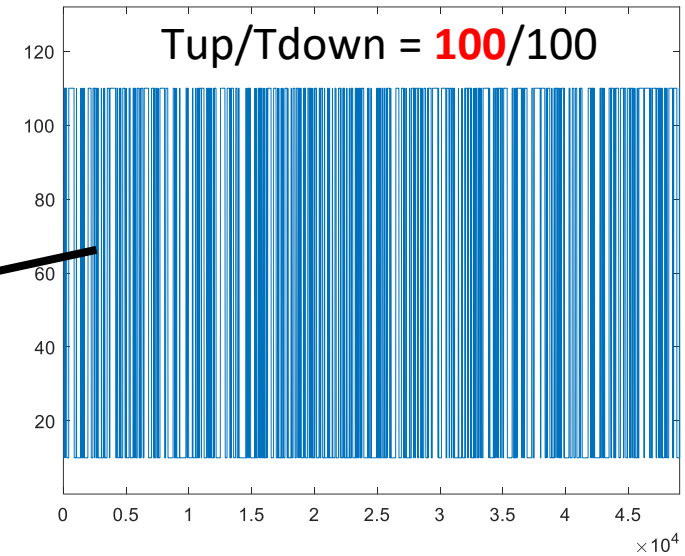
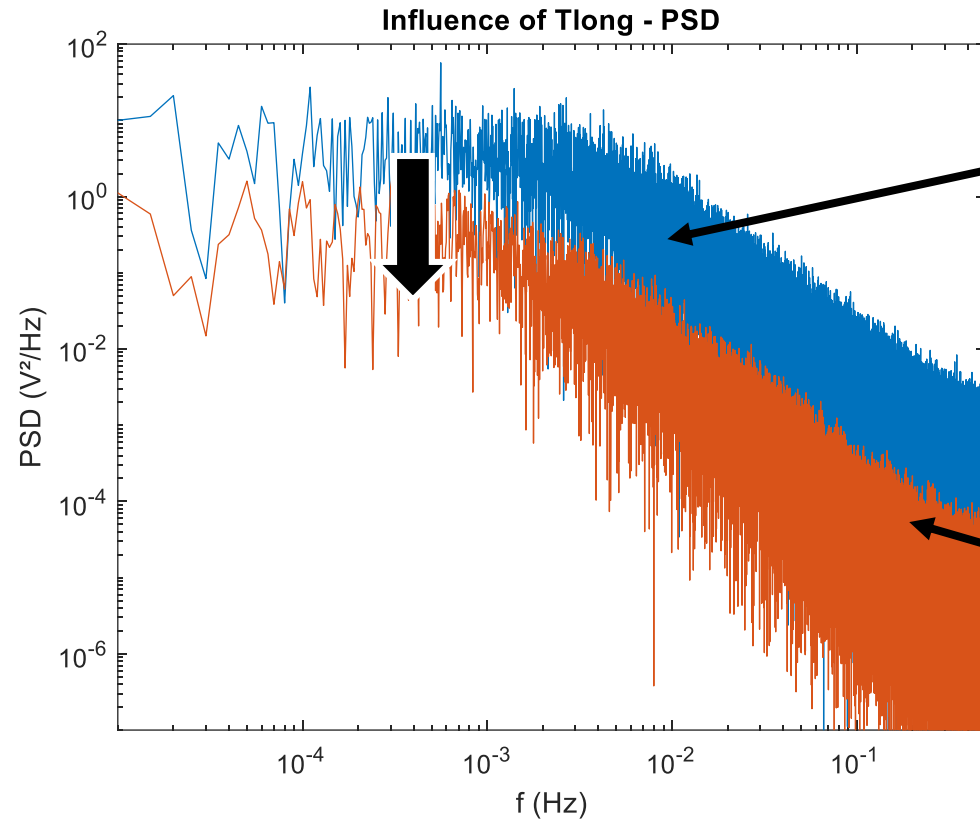


- This package contains Matlab simulation files to appreciate the influence of the RTS signal parameters on the resulting Power Spectral Density (PSD)
 - If you have access to Matlab:
 - RTS_PSD_Influence_of_Tshort
 - Shows the influence of the shortest time constant on the PSD
 - RTS_PSD_Influence_of_Tlong
 - Shows the influence of the longest time constant on the PSD
 - RTS_PSD_Influence_of_both_T
 - Shows the influence of the time constants when T_{up} and T_{down} are equal
 - RTS_PSD_Influence_of_Amplitude
 - Shows the influence of the RTS amplitude on the PSD
 - RTS_PSD_SumOfRTS_Hidden
 - Shows the PSD of the sum of 2 RTS signals where only one can be seen on the spectrum
 - RTS_PSD_Sum_Of_RTS_Visible
 - Shows the PSD of the sum of 2 RTS signals where both contributions can be observed on the spectrum
 - If you don't, the following slides summarize the simulation results

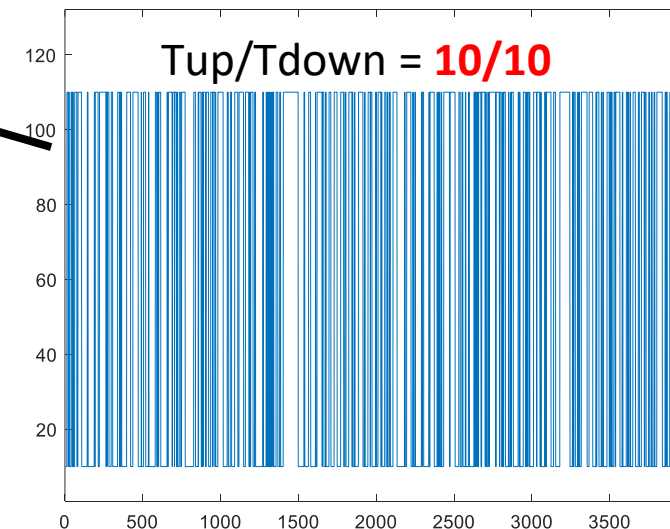
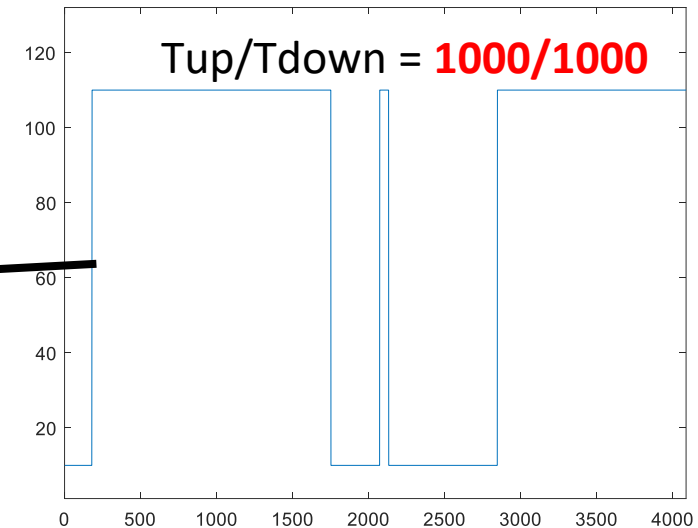
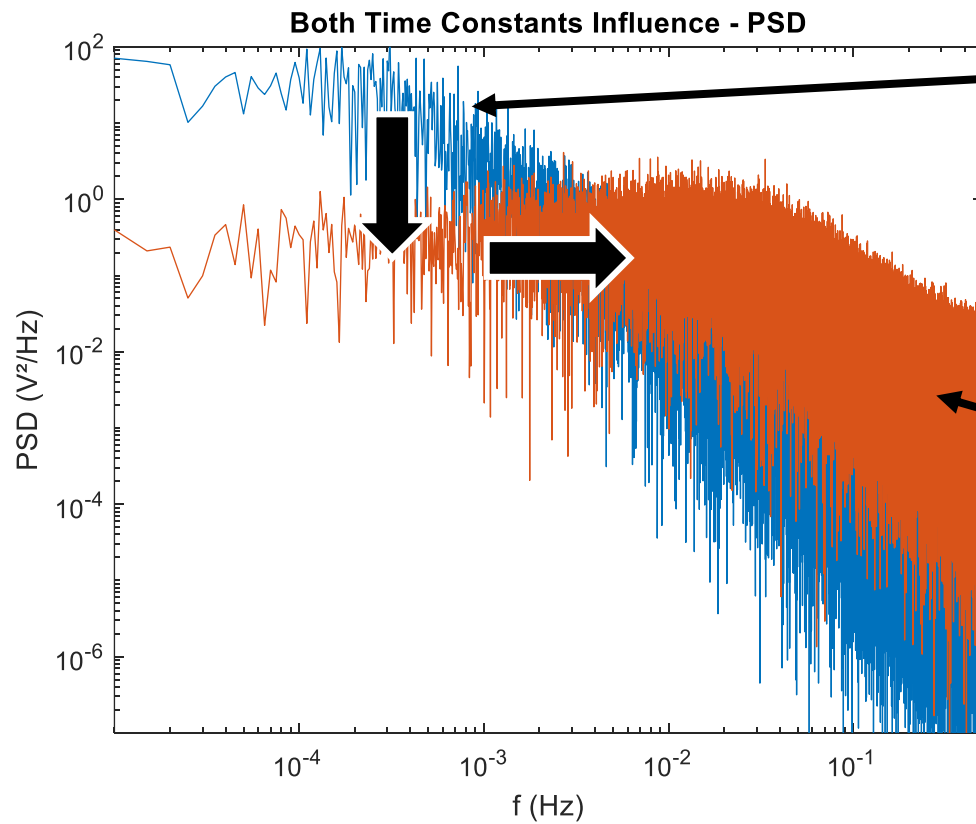
Influence of the shortest time constant



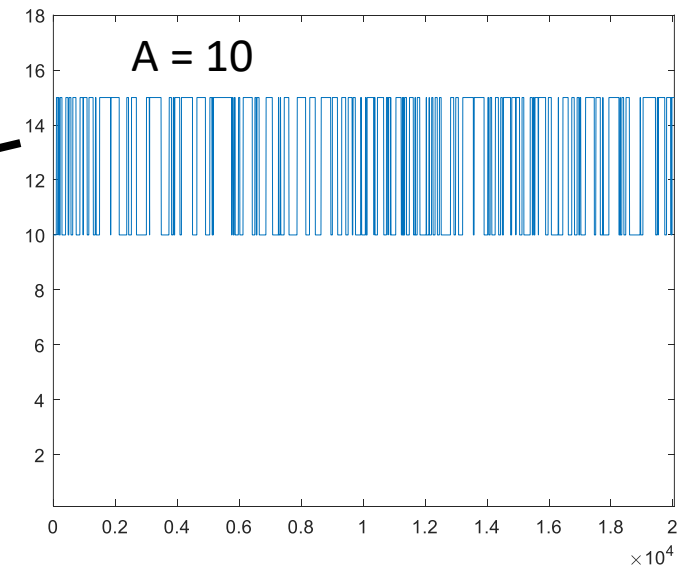
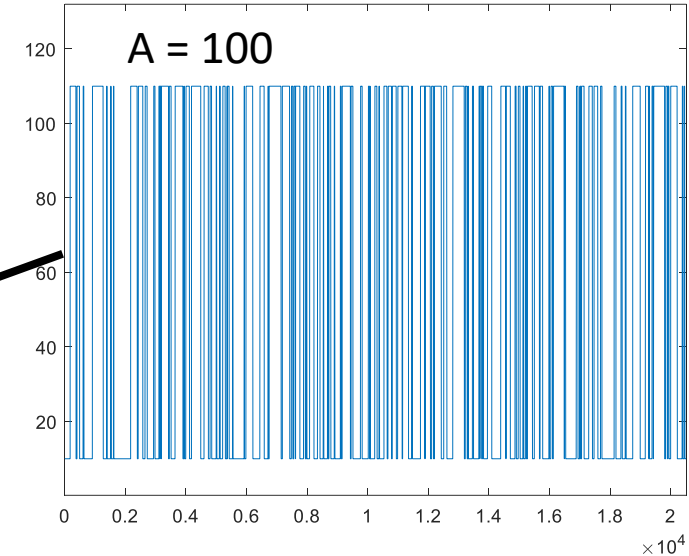
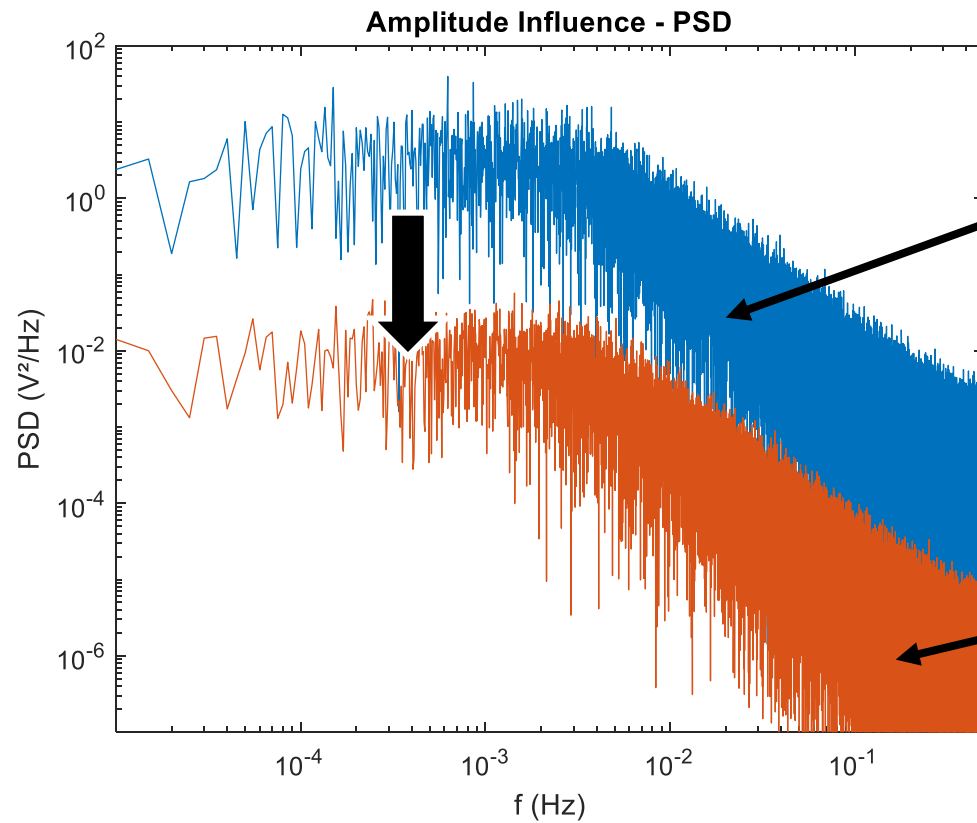
Influence of the longest time constant



Influence of the time constant when $T_{up} = T_{down}$

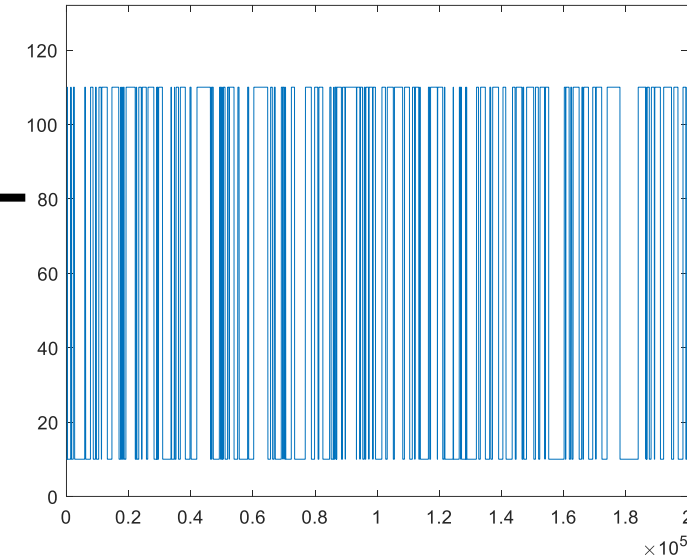
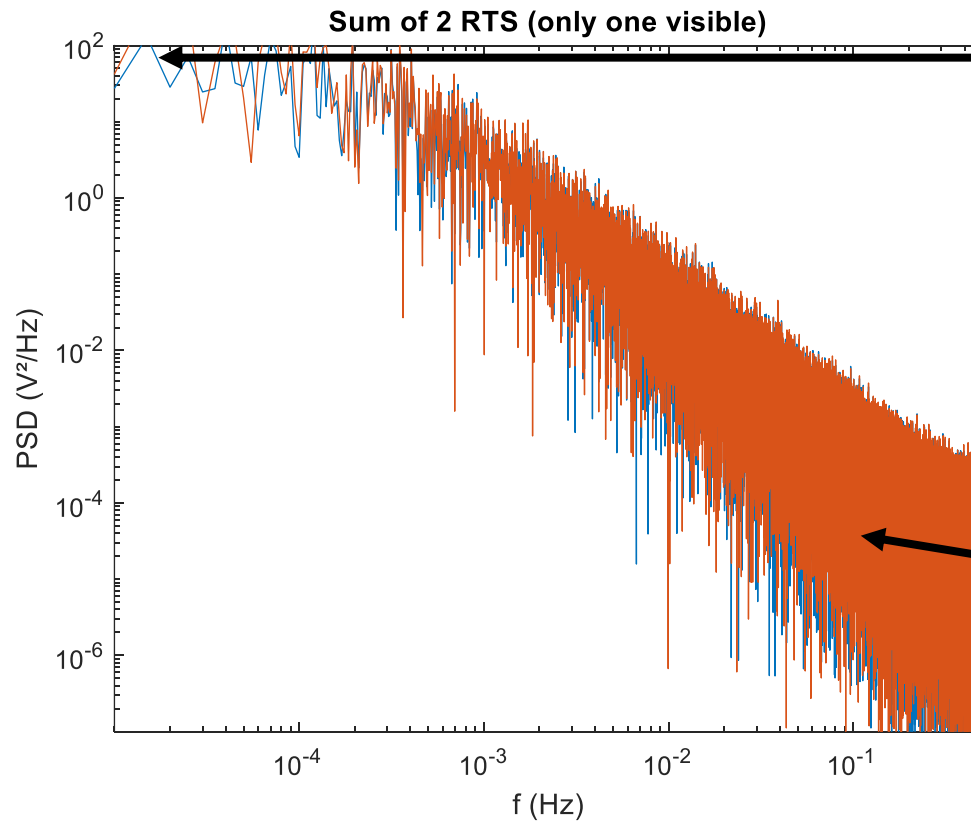


Influence of the time constant when $T_{up} = T_{down}$

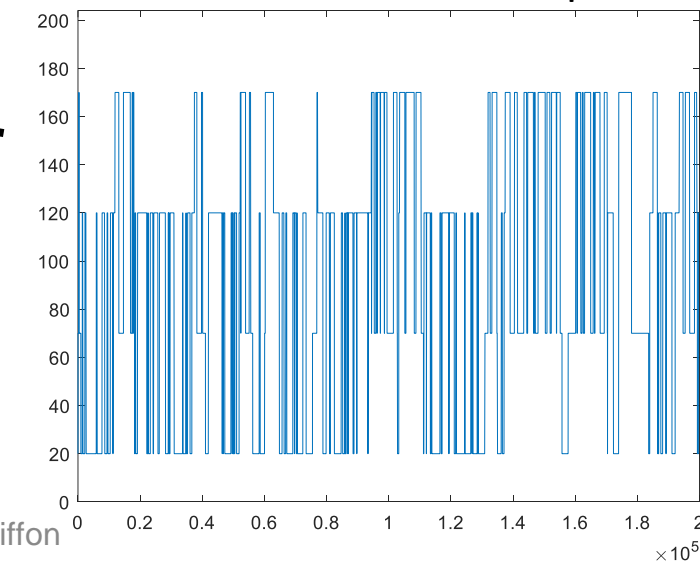


Sum of 2 RTS: Case where only one is visible on the PSD

$A = 100, T_{up}/T_{down} = 1000/1000$

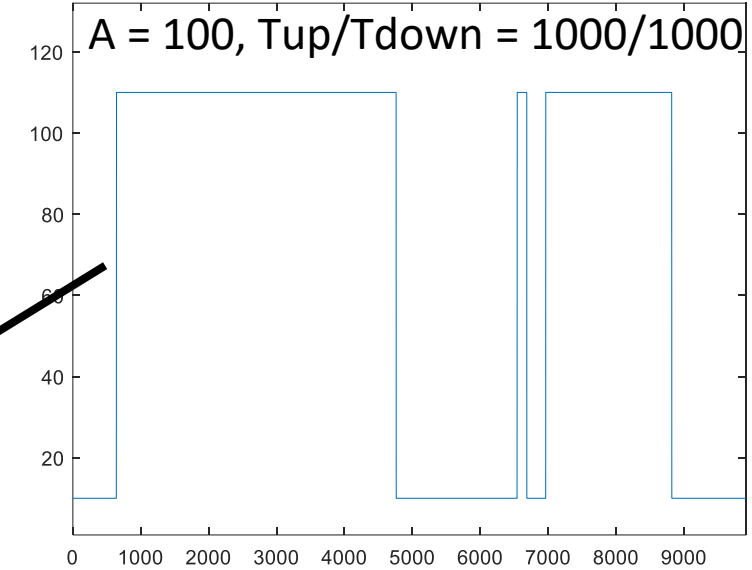
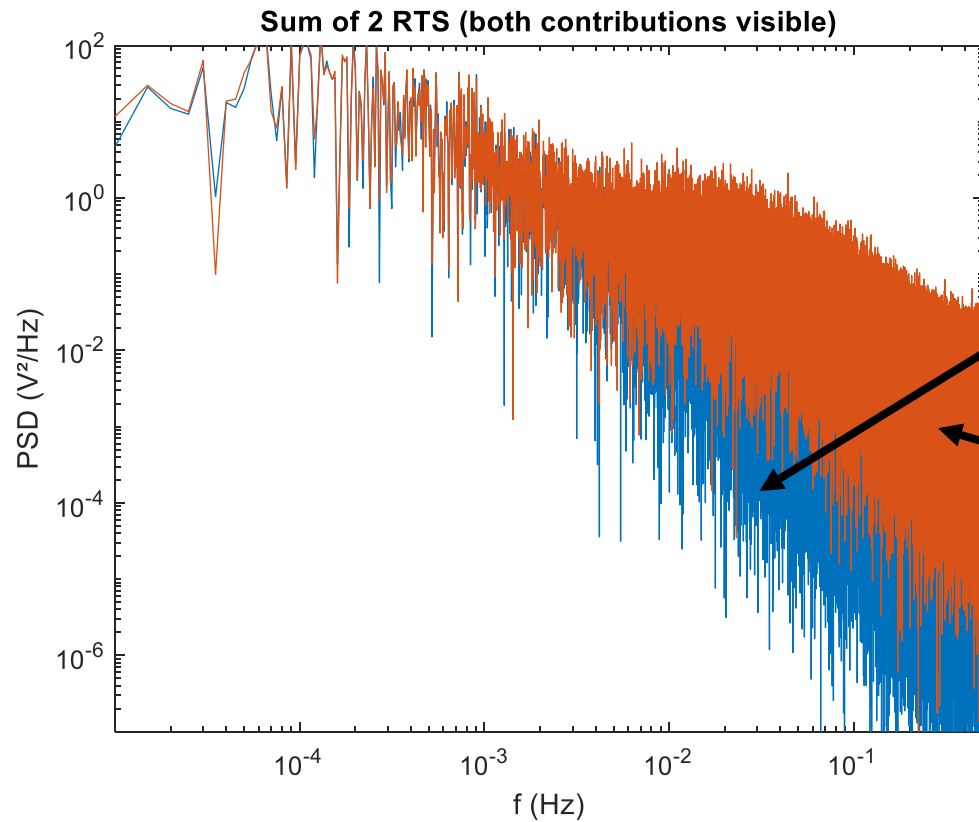


$A = 100, T_{up}/T_{down} = 1000/1000 + A = 50, T_{up}/T_{down} = 5000/10000$



Sum of 2 RTS:

Case where both contributions are visible



$A = 100, T_{up}/T_{down} = 1000/1000 + A = 100, T_{up}/T_{down} = 10/10$

