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D. Salvoni - Double dark counts rates in NbTiN SNSPD

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In this work we present a study on the dark counts rate in a NbTiN Superconducting Nanowire Single Photon Detectors (SNSPD). The strip is 80nm wide, hence we are in the 2D regime. We measure the distribution of the time intervals elapsed between two consecutive dark pulses at 4,2K and we do not observe a simple Poisson distribution as expected but a combination of two Poisson-like processes, occurring with two different rates. The two measured dark counts rate exhibit a different dependence on the bias current: one process dominates at lower bias and the other becomes more prominent as the current increases. In the scenario presented by Ejrnaes et al. [1], this result could confirm that, in this temperature regime, dark counts are generated mainly by multiple consecutive quench events. The result can also be a footprint of two different processes occurring in the nanostrip.

References [1] Ejrnaes M, Salvoni D, Parlato L, Massarotti D, Caruso R, Tafuri F, Yang X Y, You L X, Wang Z, Pepe G P and Cristiano R 2019 Scientific Reports 9 8053