

Abstract: The switch process is a binary process taking the values one and minus one corresponding to ON and OFF states, where switches occur independently. Thus the periods of staying in one of the two states are independent. We consider the simple case of the same distribution for both states. We connect this switching time distribution to the class of geometric divisible distributions, which form a proper subclass of the geometric infinity divisible distributions. There exist two versions of the switch process, a stationary and a non-stationary one. A relation between the expected value function of the non-stationary switch process and the covariance of the stationary counterpart is presented. A trinity is therefore formed between covariance, expected value, and geometric divisible distributions. The usefulness of these relations is highlighted with an example of persistency approximation in statistical physics.