

P_{error} (Bosco et al., 2003).

In Figures 7 and 8, one draws the distribution of the codes according to the number of users accepted by the CAC function for the two functions of permission $f_1(x)$ and $f_2(x)$, respectively. In these Figures the active codes are calculated for 20, 25 and 30 accepted users. As the number of users increases, the probability that the number of active codes is equal to the limits of controls increases. When the number of users is of 30, a probability to pass this limit is strong. In Figure 8, one tried to solve this problem while decreasing the threshold of controls. In this case, one notices that the number of active codes remained most time in the limit of the necessary QoS for data that is presented by the indication of the MAC layer. In this case the probability of loss is decreased. Let's note that the number of codes that guarantees a QoS accepted for the data users (loss < 0.1%) is between 12 and 13. An important remark in these Figures is the fact that the probability to pass the limit of controls is not negligible in the case where several users are accepted in the system. It is due to the fact that in this protocol, the data users wait in a tampon the liberation of a code to reach the channel. The major difference between 7 and 8 is the probability to have more that 13 active codes that are lower for the function f_2 what decreases the loss probability considerably as one sees in Figure 9. In this Figure, one notices that the second permission function decreases the loss considerably. Since up to 86 data users with a loss of 0.1% can be accepted. This function increases the capacity of the system considerably but increases the rotational delay time also in the tampon.

5. Conclusion

Within this paper, a study of a CDMA protocol for LEO constellation has been presented and discussed. The simulations results show that the choices of the permission probability function have a noticeable influence on the QoS offered to the users and to the system capacity. Following this choice, we made for voice users a comparison between the classical CDMA, qualified without limit, and the CDMA with limit. The gotten result shows clearly, that the CDMA without limit gives a better performance, because the percentage of consumption

reaches 0.26 that is of 0.33 in the other case. This value represents the efficiency of the system since the total capacity is inversely proportional to this value. As for the data users, in the same way, two functions of permission are used. These two functions differ by the control limit that is of 13 (lightly superior of the MAC layer clue) and 12 (lightly inferior of the MAC layer clue). The drawn remark is that the second permission function (most restrictive) causes a considerable loss decrease, then an increase in the system capacity.

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