VII. DISCUSSION

We notice that the two FemtoSatellites WIKISat and PCBSat share the same principal of COTS conception except the fact that they differ in the use of some specific modules. The two prototypes focused on the masse and the form guarding a basic modular architecture. PCBSat is purely commercialized and presents more advantages by the use of solar power. However, WIKISat uses a specific antenna limiting itself to a unique source of power in the form of a battery. The advantage of WIKISat in term of the integration of a specific antenna gives much more flexibility and power in communication and offers a more adaptable structure. E. Fernandez and C. Hamrouni worked on this module in order to product an antenna generation which is more miniature and adequate instead of LEO communication [5, 8]. Nevertheless, there is no unique conception, the question of communication performance remains raised since it is the most critical element in the FemtoSatellite functionality that has already suffered from power limitation and masse. It also should optimize the consumption, the management and the communication synchronization. Until now, the test of a FemtoSatellite constellation hasn't already been validated and problems of synchronization between FemtoSat with same constellation haven't already been tested too.

The first real event that will test this satellite is expected in the European competition Swarm in March 2013 [10]. P.Sundaramoorth, studied the FemtoSat ability, made this mission the fact that valorizes all optimization on power and communication. Indeed, the triple functionality-power-communication relationship remains a restraint to study for coming generations. The antenna is, consequently, the element-engine in this bilon. It remains a motivating of research field for a FemtoSat generation that looks for maximizing the spatial lifetime by the optimization of power consumption.

VIII. CONCLUSIONS

In this peppers we have presented a comparison between two approaches of USS FemtoSatellites. We have showing that engineering space is evolving rapidly in parallel with the evolution of mixed integration technology CMOS / MEMS. This Migration from one generation to another satellite has reached the stage of satellite-on- chip. These types of miniature satellites have specific missions in low orbits. Among others, the miniaturization of this system is coupled with a multi-energy deficiency which limits the lifetime of such a satellite. Communication also suffers from several constraints related to this low energy but also to the nature of the space which is noisy and loaded with thermal and magnetic fields that can affect the operation or the quality of FemtoSatelitte services. During this last decade, the research has detailed architecture and has modeled some subsystems without actually launching a prototype FemtoSat in a real application. This lack of real parameters allows the opportunity for researchers to build multiple architectures and explore some specific subsystems to optimize energy and mass keeping a limited quality service. The antenna presents one of the most principal elements that can provide a real contribution in the future generation of FemtoSatellite on Board. Further works will be done on the novel architecture conception based on a specific patch antenna mixed to a communication module.

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