In the Fig. 18, the accumulator cells are represented by two DC voltage sources, V1 and V2, that have a nominal voltage of 3.6 V. In addition, two other programmable voltage sources are connected in series with these cells in order to simulate the voltage variations. Firstly, the voltage of V3 falls down by 1 V, than rises up by 2 V and at the end it goes back to 0 V. It simulates the undervoltage and overvoltage of the lower cell. Secondly, the same process is done by V4 while the V3 stays at 0 V. It simulates the undervoltage and overvoltage of the higher cell. In the graph which can be seen in Fig. 19, both output voltages of the operating amplifiers are displayed. It is obvious that the measuring of cell voltages works properly and both amplifiers are independent.

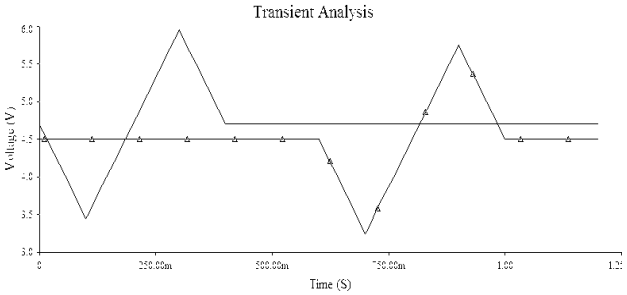

Fig. 18, Output voltage of the differential amplifiers according to the simulation (see text above)

In order to make the graph clear (so both lines could be seen), there was an offset of +0.2 V added to one of the outputs. The nominal output voltage for a cell with a nominal voltage of 3.6 V is 4.5 as stated above.

4 Conclusion

In this article the design of a small and lightweight switching power supply for a small airship operating as an autonomous monitoring system is described as well as some basic aspects of operating small airships inside the buildings. The power supply unit delivers 5 and 12 V to feed the circuits of the autonomous monitoring system described in [3]. It employs easy applicable integrated circuits, considering the demand for low electromagnetic radiation. The parts of the circuit were simulated and the appropriate printed circuit board has been produced. Nowadays the unit is being assembled in order physical tests could be processed.

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