The heat distribution of the model at t=552s where the hottest spot is still at the bottom of the battery, see Fig. 11.

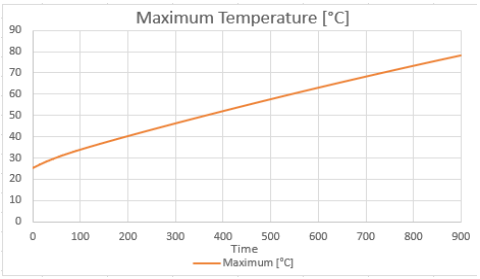

Fig. 10 - Battery's maximum temperature increase over time in the model with the heatsink.

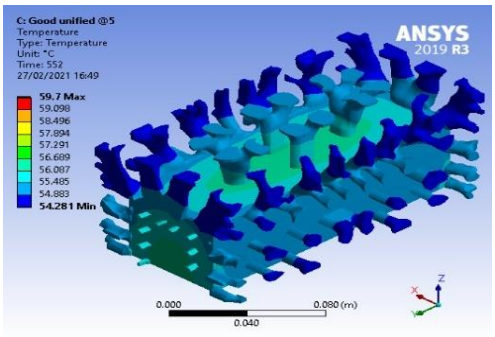

Fig. 11 - Heat distribution of the model at t=552 seconds.

By comparing the evolution of the maximum temperature of the battery along time for both models it is evident the increase of 41.1% and 75.2% in the time necessary for the temperature to reach 40ºC and 60ºC, respectively.

6. Conclusion

As evidenced by the a fore mentioned results there is an increase in the cooling performance of the BTMS and increase in the time required by the battery to reach its maximum temperature threshold.

This will in turn improve the longevity and safety of the battery. Its main limitations are the still limited cooling performance due to the poor cooling characteristics of air, as well as, the added weight of the heatsink that might be unwanted in critical applications.

Albeit further improvements could be achieved, for instance, by improving the heat transfer rate between the heatsink and the air or by individually cooling each cell through direct contact with heatsink.

Acknowledgement

This research was supported by the UIDB /00308/2020 project of the Science and Technology Foundation (FCT) of Portugal.

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