

UNIVERSITY OF AMSTERDAM

## *Abstract*

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### **Models of Particle Signatures in KM3NeT ORCA**

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The KM3NeT ORCA detector aims at uncovering the neutrino mass ordering (NMO), for which accurate predictive particle signal models are needed. Photo-electron yield models of product particles in KM3NeT ORCA are produced. The models are presented and shown to accurately replicate expected behaviour of electromagnetic particles, hadronic particles, and muons. The use of the models for reconstruction of individual showers and entire neutrino events in ORCA is then explored, and shown to be competitive in the best cases. Finally, the models are used to perform rapid Monte Carlo simulations, showing good agreement to the original sample in the number of photo-electrons and number of hits, with deviations in time arrival. Avenues towards future use and improvements of the models are suggested.