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## Simulation and resolution of voltage reversal in microbial fuel cell stack

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### Abstract:

To understand the biotic and non-biotic contributions of voltage reversals in microbial fuel cell stacks (MFC) they were simulated with an electronic MFC-Stack mimic. The simulation was then compared with results from a real 3 litre triple MFC-Stack with shared anolyte. It showed that voltage reversals originate from the variability of biofilms, but also the external load plays a role. When similar biofilm properties were created on all anodes the likelihood of voltage reversals was largely reduced. Homogenous biofilms on all anodes were created by electrical circuit alternation and electrostimulation. Conversely, anolyte recirculation, or increased nutriment supply, postponed reversals and unfavourable voltage asymmetries on anodes persisted. In conclusion, voltage reversals are often a negative event but occur also in

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