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# Developments towards autonomous optimisation and stabilisation of the CERN GTS-LHC ion source

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Building on first experience with state-of-the-art model-based adaptive stabilisation algorithms, this contribution presents the results obtained at the LINAC3 ion source after introducing a hierarchical control architecture to better deal with the different response times after control parameter changes. Tailor-made algorithms were necessary to limit exploration during periods of change of the overall system. The obtained performance will be shown and the remaining challenges and steps towards operational deployment will be summarised.

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