

# DEEP REINFORCEMENT LEARNING FOR AUTOMATED TUNING OF CAVITY FILTERS

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**Abstract** - Due to recent rise in the communication, the network providers are motivated to install new Radio Base Stations (RBS). RBS are installed with Microwave/Radio-frequency cavity filters owing to their robustness, high Q-factor and the capability of operating at high bandwidths. This filter works in collaboration with an antenna to send and receive signals to and from the customers/clients. Meeting the raised connectivity demands raised the production of these filter. After production, due to various imperfections in the design and filter tolerances, the filter needs to be properly tuned by experts to meet the required characteristics. The tuning of these filters is a complex, time consuming and an expensive task. This led to a need of using Artificial Intelligence (AI) to perform automatic tuning. Using Artificial Neural Networks (ANN) approach is the best fit in this kind of problem where the system can be treated like a “Black-Box” as compared to other AI techniques like on Fuzzy Logic, Adaptive Models, Support Vector Machines, Random Forest etc. where a mathematical model is needed. Using the recent break-throughs and developments in terms of Machine Learning algorithms - especially Deep Learning (DL), it is possible to tune the most complex filters.

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