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(54) **DYNAMIC BANDWIDTH OPTIMIZATION FOR OPERATIONAL AMPLIFIERS**

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(57) **ABSTRACT**

This disclosure provides methods, devices, and systems for operational amplifier frequency compensation. The present implementations more specifically relate to techniques for dynamically calibrating the capacitance of a compensation capacitor based on the frequency at which an operational amplifier oscillates. In some aspects, an operational amplifier may include a differential input stage, a high gain stage, and a frequency compensation controller configured to operate the operational amplifier in a normal mode or a calibration mode. Compensation capacitors are switchably coupled between the outputs of the differential input stage and the outputs of the high gain stage based on the operating mode of the operational amplifier. More specifically, in the calibration mode, the coupling of the capacitors causes an output voltage of the op amp to oscillate relative to an input voltage. By contrast, in the normal mode, the coupling of the capacitors causes the output voltage to track the input voltage.