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Abstract
In Electrical Impedance Tomography (EIT) system, it’s import to support the stable current source for obtaining the image quality. From the literatures, there are three kinds of the circuit type proposed frequently. The six different Op Amp devices with different frequency response are used as experimental devices. Then the simulation results support us to design the current source of the multi-frequency EIT system. The results are as follows: The difference between results when using the different circuit types based on the same Op Amp devices isn’t obvious. For stability of output current as using the chip of THS4021, although the measurements compared to the simulation is a little difference. One Op Amp circuit type when the load resistance is changing and the work frequency is less 100kHz, that the variablility of measured data is less 0.068%. When R4b is tuned between ±5%, the difference between results simulated when using some Op Amp devices with high or middle frequency response isn’t obvious. For one Op Amp circuit type, the devices of THS4021 are used at the working frequency of 1MHz the circuit own good linearity with the correlation coefficient is 0.9999. The circuit own output impedance of several MΩ for the three kinds of circuit type when using THS4021 device. THS4021 use one Op Amp circuit type. The measurement of output impedance at working frequency of 1kHz is 346.682937kΩ. For the systems including DDS with VCCS, the output current at 100Hz and 1MHz THD are 0.33094% and 2.30971%, respectively. According to these results, it provides significant information to choose Op Amp devices or circuit types. This system also provides users the easy-to-use GUI. Via GUI, it can be easily modified for output frequency and current.
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