Critical ill-posed problems in Three-Dimensional Electrical Impedance Tomography (3D EIT) of vessels that have a metallic structure

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The difficulties of solving forward and inverse problems in conducting boundary domains would be explored. In such applications, the “metal wall measurement strategy” is employed. This technique uses the three-terminal measuring method, in which the tomography measurements are taken with reference to the grounded wall of the vessel. This creates two problems; firstly, the boundary voltage measurements taken from the farthest electrodes are very low. Secondly, the small nodal potentials across the entire domain cause a significant decrease in the sensitivity of the tomography system with respect to conductivity changes. Therefore, 3D EIT image reconstruction problem would be critically ill-posed.