

Local corrosion remains one of the main threats to structural materials used in industries. Despite an extensive research of materials characterized by the presence of active-passive cells, an identification of the nature of electrical changes that occur during the individual stage of corrosion has not been finally resolved. The reason for this are major problems connected with: localness, lack of stationarity and non-linearity of the local corrosion processes. Resolving these issues is the authors' objective. As the most suitable technique the authors have chosen Scanning Electrochemical Microscopy (SECM) with some improvements. The selected equipment is setup on alternating current mode of SECM (AC-SECM) and modified to possibility of multifrequency impedance spectroscopy.

In order to implement the project authors would like to:

- applied amplitude analysis to obtain harmonics (first, second, third)
- impedance measurements to define electric properties of material

The main objective of this Project is to create a new approach to studying inhomogeneous materials, particularly with passive-active zones in liquid environments. The proposed hypothesis of this Project is based on local multifrequency impedance imaging of mentioned materials in conditions close to natural occurrence. This might lead to obtaining valuable information about the kinetics of corrosion reactions and will contribute to enriching the knowledge about corrosion process.