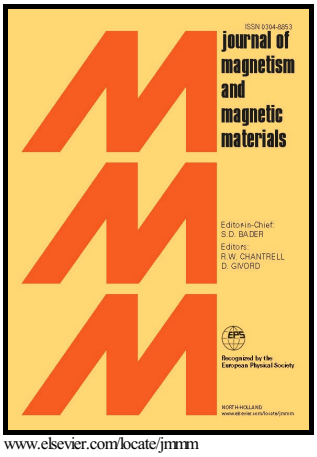

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Phase autowaves in the near-electrode layer in the electrochemical cell with a magnetic fluid

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ABSTRACT . A change in color of the thin pellicle when light is reflected from the surface of the magnetic fluid at the interface with the transparent electrode in the electric field was observed. The formation of variable thickness near-electrode layer leads to a change in the spectrum of the reflected light depending on the applied voltage. Autowaves , that were observed in the layer are a unique object for the study of self-organization process.

KEYWORDS: magnetic fluid; autowave process; active environment; interference; reverberator; pacemaker.

1. Introduction

Autowave processes are vivid examples of self-organization. The importance of these processes studying caused by including the fact that they are widely distributed in living organisms, such as autowaves in cardiac muscle, brain and nervous fibers. We can easily observe autowaves visually in Belousov-Zhabotinsky chemical reaction (BZ-reaction) when the color of the solution changes from time to time. If this solution is poured in a Petri dish as a thin layer, we can see brightly colored autowaves with typical leading centers (pacemakers), vortices (reverberators), the annihilation of the waves in a collision, the suppression of low-frequency sources by high-frequency ones etc. But BZ-reaction can be observed only by a few tens of cycles, then the stock of the reactants is exhausted and the reaction stops. BZ - reaction in microemulsions was described [1]. Other examples of self-organization in heterogeneous systems, which can be visually ob-