

S E M I N A R



Prof Gurgen G. Adamian
*(Joint Institute for Nuclear
Research, 141980 Dubna,
Russia)*

Date:
Monday, 19 January 2026

Time:
14h00-15h00 SAST

Venues:

- **NITheCS Seminar Room**
University of KwaZulu-Natal
Westville Campus
3rd Floor, H-Block,
School of Chemistry and Physics
- **Online**

WHO SHOULD ATTEND?

The seminar should be accessible to advanced undergraduates and will highlight results that should interest advanced researchers.

ENQUIRIES:

Email Prof Ilya Sinayskiy
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Quantum Hall effect in alternating electric field

ABSTRACT

In two-dimensional systems, the influence of the external alternating electric field on the quantum Hall effect is studied within the theory of open quantum systems. Charge carriers are treated as quantum particles interacting with the environment through a one-body (mean-field) mechanism.

The average time of collision of charge carriers with impurities effectively takes into account two-body effects. Taking into account non-Markovian effects, the electrical conductivity tensor is analytically expressed in terms of cyclotron frequency and frequency of external electric field. The theory is applied to describe the real and imaginary parts of the dynamic conductivity in $\text{GaAs}/\text{Al}_x\text{Ga}_{1-x}\text{As}$ heterojunctions at various alternating electric fields. The dependence of the magnetic moment of two-dimensional systems on the magnetic field is predicted at various temperatures and frequencies of external electric field.

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