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**MINISTRY OF EDUCATION
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UDMURT STATE UNIVERSITY

**PHYSICAL FACULTY
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**MICROWAVE SPECTROMETER FOR RESEARCH OF ELECTRIC AND MAGNETIC
PROPERTIES OF CONDENSED SUBSTANCES**

Graduate work

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Methodical guide to laboratory work “Ferromagnetic resonance in samples with anisotropy of shape».	
16 p.	
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Instrument Specifications. 12 p.	
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Technical Data for Standard Rectangular Waveguides. 1 p.	

CONCLUSION

Currently, a relevant and interesting topic is the study of the spectral properties of nonequilibrium condensed matter and their dynamics in time. Due to the extreme difficulty in constructing a more accurate theoretical model, questions of studying the spectra of emission and absorption of liquid media become fundamentally important, which leads to the need for more detailed experiments in this area.

Therefore, this graduate work is devoted to the development of a facility for microwave spectral analysis of condensed matter in the frequency range 1 - 12 GHz, which allows real-time recording of absorption spectra: FMR, contact and non-contact activated liquids and other substances. Automation of data collection on a microwave spectrometer using recording instruments and an analog-to-digital computer converter allows fast processes to be recorded, as well as long-term experiments without the need for constant human control.

In the course of the graduate work, the following results were obtained:

- 1. A stand and methodological guidelines for laboratory work “Ferromagnetic resonance in samples with anisotropy of shape” have been developed.**
- 2. A unique facility was assembled for conducting spectral microwave analysis of condensed matter in the range 1.02 - 12.05.**
- 3. Automated data collection from a microwave spectrometer using recording instruments and an analog-to-digital computer converter.**