Ildar **Yusupov**

RF Engineer · Postdoctoral Researcher

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Summary

Postdoctoral researcher with a PhD in RF and microwave engineering and a strong background in passive wireless systems. Experienced in full-cycle development of compact passive structures and advanced RF components for wireless identification and sensing applications. Skilled in simulation (CST, MATLAB), prototyping, and experimental validation. Co-author of 14+ peer-reviewed publications in Q1 journals.

Education

ITMO University, Faculty of Physics — *Saint Petersburg, Russia*

Ph.D. in Microwave and RF Engineering — *2020 – 2024*

- Thesis: *Application of high-Q ceramic resonators in radio-frequency identification systems and microwave sensors*

ITMO University, Faculty of Physics — *Saint Petersburg, Russia*

M.Sc. in Engineering Physics — *2018 – 2020*

- Thesis: *Development and research of ceramic tag properties for radio-frequency identification*

Kazan National Research Technical University named after A.N.Tupolev (KNRTU-KAI) — *Kazan, Russia*

B.Sc. in Electronic and Photonic Engineering, *cum laude* — *2014 – 2018*

- Thesis: *UV laser pulsed pump control module*

Employment History

School of Physics and Engineering, ITMO University — *Saint Petersburg, Russia*

Junior Researcher — *2021 – Present*

- Managed and contributed to scientific research projects in RF and microwave engineering.
- Responsible for experimental validation, data analysis, and preparation of scientific publications.
- Prepared and maintained research grant documentation; supported grant proposals and reporting.

School of Physics and Engineering, ITMO University — *Saint Petersburg, Russia*

Engineer — *2019 – 2021*

- Supported research activities through modeling, simulation, and prototyping.
- Worked closely with senior researchers on experimental setup and data acquisition.

Technical Skills

RF Circuit Design	Design and tuning of passive components (filters, matching networks), RF layout optimization, impedance matching
Antenna & System Integration	Custom antenna design (UHF, NFC, RFID), integration of high-permittivity dielectric resonators, simulation-to-prototype workflow, compact system integration
Measurement & Validation	Hands-on VNA measurements, S-parameter analysis, anechoic chamber testing, EMC/EMI pre-compliance
Simulation & CAD Tools	CST Studio Suite, MATLAB, Python (SciPy, NumPy), HFSS (basic)
Prototyping	Basic PCB design, soldering and RF assembly, iterative testing, design optimization
Collaboration & Communication	Technical documentation, grant reporting, conference presentations, cross-functional teamwork, agile research environments, English (B2), Russian (native), Japanese (basic conversational)

Publications

Journal Articles

[1] A. Maksimenko, D. Dobrykh, **I. Yusupov**, et al., "Miniaturization limits of ceramic UHF RFID tags," *Scientific Reports*, vol. 15, no. 1, pp. 10984, 2025.

[2] D. Shestakov, E. Khairullina, A. Shishov, **I. Yusupov**, et al., "Fabrication of copper patterns on a curved surface by direct laser metallization from deep eutectic solvents," *Advanced Engineering Materials*, vol. 27, p. 2401652, 2025.

[3] A. Kharchevskii, **I. Yusupov**, D. Dobrykh, et al., "Long-range over-a-meter NFC link budget with distributed large-area coils," *Photonics and Nanostructures - Fundamentals and Applications*, vol. 63, p. 101327, 2025.

[4] D. Dobrykh, A. Maksimenko, **I. Yusupov**, et al., "Resonance cascading in a ceramic tag for long-range omnidirectional radio-frequency identification communication," *Physical Review Applied*, vol. 20, no. 6, p. 064022, 2023.

[5] **I. Yusupov**, D. Dobrykh, P. Terekhina, et al., "Quasi-BIC high-index resonators for liquid characterization and analysis," *Applied Physics Letters*, vol. 123, no. 24, 2023.

[6] A. Koshkimbay, **I. Yusupov**, B. Orazbayev, et al., "Trapping EM power by hollow cylinders," *IEEE Transactions on Microwave Theory and Techniques*, 2023.

[7] **I. Yusupov**, D. Dobrykh, D. Filonov, et al., "Miniature long-range ceramic on-metal RFID tag," *IEEE Transactions on Antennas and Propagation*, vol. 70, no. 11, pp. 10226–10232, 2022.

[8] G. Kurganov, D. Dobrykh, E. Puhtina, **I. Yusupov**, et al., "Temperature control of electromagnetic topological edge states," *Applied Physics Letters*, vol. 120, no. 23, pp. 233105, 2022.

[9] D. Dobrykh, **I. Yusupov**, P. Ginzburg, et al., "Self-aligning roly-poly RFID tag," *Scientific Reports*, vol. 12, pp. 2140, 2022.

[10] **I. Yusupov**, D. Filonov, A. Bogdanov, et al., "Chipless wireless temperature sensor based on quasi-BIC resonance," *Applied Physics Letters*, vol. 119, no. 19, 2021.

[11] A. Mikhailovskaya, D. Shakirova, S. Krasikov, **I. Yusupov**, et al., "Anapole-enabled RFID security against far-field attacks," *Nanophotonics*, vol. 10, no. 17, pp. 4409–4418, 2021.

[12] A. A. Mikhailovskaya, **I. Yusupov**, D. Dobrykh, et al., "Omnidirectional miniature RFID tag," *Applied Physics Letters*, vol. 119, no. 3, 2021.

[13] S. Krasikov, M. Odit, D. Dobrykh, **I. Yusupov**, et al., "Multipolar engineering of subwavelength dielectric particles for scattering enhancement," *Physical Review Applied*, vol. 15, no. 2, pp. 024052, 2021.

[14] **I. Yusupov**, D. Filonov, T. Vosheva, et al., "Efficient radiational outcoupling of electromagnetic energy from hyperbolic metamaterial resonators," *Scientific Reports*, vol. 10, no. 1, pp. 21854, 2020.

[15] D. Dobrykh, D. Shakirova, S. Krasikov, A. Mikhailovskaya, **I. Yusupov**, et al., "Multipole engineering for enhanced backscattering modulation," *Physical Review B*, vol. 102, no. 19, pp. 195129, 2020.

Conference Proceedings

[16] D. Dobrykh, A. Maksimenko, **I. Yusupov**, and M. Udrov, "Temperature sensing with passive ceramic RFID tag," in *Proc. 2024 Antennas Design and Measurement Int. Conf. (ADMInC)*, 2024, pp. 30–32.

[17] S. Geyman, J. D. Grigorovich, **I. Yusupov**, and M. Udrov, "Two-dimensional near-field localization of active tag in the NFC frequency range," in *Proc. 2024 ADMInC*, 2024, pp. 23–25.

[18] J. D. Grigorovich, S. Geyman, **I. Yusupov**, and M. Udrov, "Distance determination of active tag location in the near field of two coils on NFC standard frequency," in *Proc. 2024 Antennas Design and Measurement Int. Conf. (ADMInC)*, 2024, pp. 26–29.

[19] **I. Yusupov**, D. Dobrykh, A. Slobozhanyuk, et al., "Passive microwave sensors based on quasi-BIC," in *Proc. 2024 IEEE Wireless Power Technology Conference and Expo (WPTCE)*, 2024, pp. 869–871.

[20] Y. Grigorovich, S. Geyman, **I. Yusupov**, and M. Udrov, "Increasing the near-field interaction of a flat spiral coil by optimizing the distribution of currents in its turns," in *Proc. 2023 Antennas Design and Measurement Int. Conf. (ADMInC)*, 2023, pp. 89–92.

[21] D. Dobrykh, A. Maksimenko, **I. Yusupov**, et al., "Ceramic RFID tag for omnidirectional long-range communication," in *Proc. 2023 IEEE-APS Topical Conference on Antennas and Propagation in Wireless*, 2023.

[22] D. Dobrykh, **I. Yusupov**, A. Slobozhanyuk, D. Filonov, and P. Ginzburg, "Compact long-range ceramic RFID tag for on-metal and non-metal applications," in *Proc. 2022 IEEE Int. Conf. on RFID Technology and Applications*, 2022.

[23] **I. Yusupov**, D. Dobrykh, D. Filonov, A. Slobozhanyuk, and P. Ginzburg, "Compact ceramic on-metal RFID tag," in *Proc. 2022 IEEE-APS Topical Conf. on Antennas and Propagation in Wireless Communications (APWC)*, Cape Town, South Africa, 2022, pp. 084–084.

[24] **I. Yusupov**, D. Filonov, A. Bogdanov, P. Ginzburg, M. V. Rybin, and A. Slobozhanyuk, "Passive temperature sensor tag based on quasi-BIC," in *Proc. 2022 7th Int. Conf. on Smart and Sustainable Technologies (SpliTech)*, Split / Bol, Croatia, 2022, pp. 1–4.

[25] A. Mikhailovskaya, **I. Yusupov**, D. Dobrykh, S. Krasikov, D. Shakirova, A. Bogdanov, D. Filonov, and P. Ginzburg, "Miniaturized all-angle accessible RFID tag," in *Proc. Journal of Physics: Conference Series*, vol. 2015, no. 1, pp. 012092, 2021.

Selected Projects

- **Compact Ceramic RFID Tags**
  Modeling and optimization of high-permittivity dielectric resonators for passive RFID.
  – Designed and simulated compact tag structures for the UHF band.
  – Fabricated prototypes and conducted performance testing.
  – Optimized tags for on-metal mounting and omnidirectional reading.
- **Microwave Sensors Based on High-Q Resonators**
  Study of quasi-bound states in the continuum (quasi-BICs) for temperature and liquid sensing.
  – Performed numerical modeling and fabricated dielectric resonator sensors.
  – Conducted experimental validation under varying conditions.
- **Hyperbolic Metamaterials for EM Outcoupling**
  Theoretical study of radiative extraction from hyperbolic metamaterials using dielectric resonators.
  – Performed full-wave simulations.
  – Analyzed Purcell factor and radiation enhancement mechanisms.
- **Tunable Topological Photonic Structures**
  Experimental investigation of temperature-tuned topological edge states.
  – Assisted in fabrication of ferroelectric resonator arrays.
  – Participated in heating experiments and analysis of mode transitions.

Additional Experience

State Academic Scholarship, Ministry of Education — *Russia*
Scholarship Recipient — *2014 – 2020*

Government Scholarship of the Russian Federation — *Russia*
Scholarship Recipient — *2023 – 2024*

Tel Aviv University, School of Electrical Engineering — *Tel Aviv, Israel*
Visiting Research Student — *Oct – Nov 2023*

- Research stay with Prof. Pavel Ginzburg, focusing on advanced RF and microwave technologies

IEEE (Council on RFID, MTT-S) and SPIE
Member of International Professional Societies

References

References available upon request.