



November 7, 2022

To whom it may concern,

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## Notice on the Successful Verification of Microcells for Quantum Sensors at The University of Tokyo -Contribution to the Research of the Dark Matters in the Space-

We are pleased to inform that we have succeeded in the verification of the alkali atomic microcells for quantum sensors (our produce) at The University of Tokyo, and such results shall be made in the presentation at the domestic academic conference (The 39th “Sensor Micromachine and Application System” Symposium).

### 1. Objectives and overview of the verification test

As we can see in that fact that the Nobel Prize 2022 Physics winner was the researcher of “quantum entanglement,” further technology innovation has lately been expected in the quantum field which is the base of optical devices including communication and laser, and our company will greatly contribute to this quantum field (see Figure 1. Items where quantum sensor, optical quantum communication are applied).

Quantum sensors are expected to be the next-generation ultra-highly sensitive sensors and said to be able to detect dark matters in the space. We have now succeeded in obtaining a good result by conducting Cs absorption saturation spectroscopic test using microcells (see Figure 2. Microcells produced by us) mainly with Professor Takanori Aoki and others in the Torii lab at The University of Tokyo Graduate School aiming search for such dark matters.

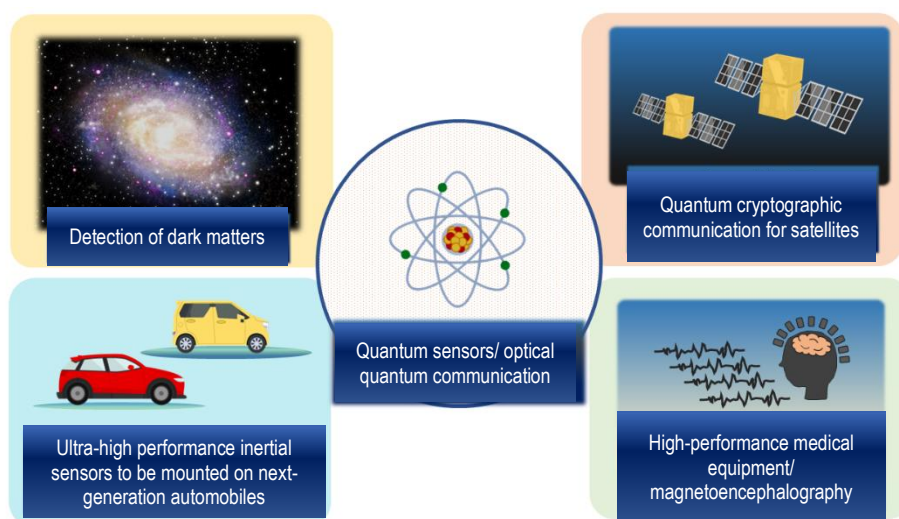


Figure 1. Items where quantum sensor, optical quantum communication are applied

Widely applied including detection of dark matters in the space, quantum cryptographic communication in satellites, inertial sensors to be mounted on ultra-high performance next-generation automobiles, magnetic sensor such as magnetoencephalography for medical treatment.

As microcells are smaller in size, consume less power and allow us to greatly reduce the measurement time compared with the conventional cells, there are a lot of demands for them besides the use for miniature atomic clock. It has been determined that such result will be presented at the 39th “Sensor Micromachine and Application System” Symposium, one of the largest academic conferences in Japan regarding the field of MEMS, Micro Electromechanical Systems applying the semiconductor technology. Information on the presentation shall be provided in the next page.

## 2. Information on the presentation

Conference title:

The 39th “Sensor Micromachine and Application System”  
Symposium

Date: November 14, 2022 (Mon) – November 17, 2022 (Thu)

Venue: Asty Tokushima (Tokushima Pref.)

Date and time: November 16, 2022 (Wed) 12:50-14:20

Title: Cs Atomic Microcell Spectroscopy for Quantum Sensors

Presentation No.: L-280

Conference URL : <https://sensorsymposium.org/>

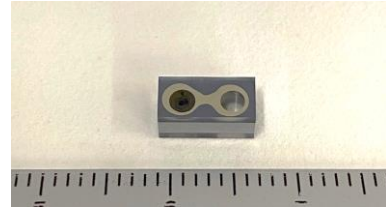


Figure 2. Microcell for the quantum sensor produced this time

## 3. Background

As announced in “Commencement of Research on Application Using a Small Atomic Clock and Atomic Clock” dated July 6, 2020, with Professor Takahito Ono of the Graduate School of Tohoku University as the representative for the research, we have proceeded with the joint research of the application using a small atomic clock and atomic clock.

As announced in the “Notice on Success of Production of Sales of Gas Cells of New Miniature Atomic Clocks -Emergence into the New Market from Ultra-high Precision Magnetic Sensor to Gyroscope Sensor-“ dated September 10, 2021, we succeeded in development of a gas cell (microcell) used for miniature atomic clocks and proceeded with hearing on the specifications, etc. focusing on sales of microcells only and with the further research and development for achievement of verification for quantum sensors as informed in this notice.

As needs of the time and society drastically change, we are aiming for business expansion by expanding the existing domains to new domains by finding new challenges and needs. We will continue to contribute to achievement of “decarbonated society” by providing solutions in “communication,” “energy” and “space” fields.