Novel intelligent vehicles to monitor water source safety for 2022 Winter Olympic Games

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Science Island's Intelligent Vehicle

Will serve the 2022 Olympic Winter Games as it completed its trial operation in Guanting Reservoir, Beijing

A water quality monitoring unmanned surface vehicle helps to improve the reservoir water environment. Credit: Yu Daoyang

As the 2022 Beijing Winter Olympic Games are approaching, it's a high priority to guarantee the water quality of Guanting Reservoir, one of the water resources of the Games.

Recently, researchers from the Institute of Solid State Physics (ISSP), Hefei Institutes of Physical Science (HFIPS), and their collaborators developed a [water quality](link) [monitoring](link) unmanned surface vehicle, which has been put into trial operation in Guanting Reservoir.

"We have been working on this project for more than three years," said Dr. Yu Daoyang, a physicist in ISSP. "The existing surface [water](link) monitoring system in China is mainly based on on-line monitoring of fixed monitoring stations and manual sampling laboratory analysis. This new instrument has been much improved in many aspects."

The microfluidic sampling system based on the flow path precise control technology ensured the fast, in-situ and online monitoring for unmanned vessels. Even in complex environments, the unmanned ship multi-mode control system and the cross-platform control system can ensure its stability and reliability.

The researchers also solved [technical problems](link) like synchronicity of various detection methods in time and space, and the anti-counterfeiting of the detection data.

Made of high quality [stainless steel](link) to prevent corrosion, this vehicle is 3.6 meters long and 1.8 meters wide. It's powered by pure electricity and can last for more than eight hours. The [maximum speed](link) is 10km/h, twice as much as an adult's walking speed, and its 300 kilograms' load would amount to the weight of a large lion.

"This is the largest water quality monitoring unmanned surface vehicle in China so far," Dr. Yu explained, "with the most complete functions and advanced intelligent software."

The team has made a series of water surface robots, including river and lake management platform, intelligent water cleaning robot, and water

ecology precision repair and process management.

Featuring on fast movement and self-navigation, the products will improve the environmental regulation efficiency, accuracy and intelligent level of reservoir water.

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