



*[Provisional Translation Only]*

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## **JDI Receives Best Paper Award at the 30th International Display Workshop -Liquid Crystal Intelligent Reflecting Surface for 47GHz Radio Waves-**

JDI is pleased to announce that our paper titled “Intelligent Reflecting Surface Based on LCD-TFT Technology for 47 GHz Radio Waves” has received the Best Paper Award at the 30th International Display Workshop (IDW '23) held in Niigata City in December 2023.

Intelligent Reflecting Surface (IRS) is a promising device that can control the reflection direction of radio waves arbitrarily. The IRS is a reflector with tiny reflective elements, and by controlling the reflection characteristics of each element, it is possible to control the reflection direction. Millimeter waves which enable high-capacity communication exemplified by 5G mobile network, have high directivity and face challenges in reaching certain areas with radio waves. By reflecting millimeter waves in the desired direction, the IRS is expected to improve communication environments in areas where radio waves are difficult to reach, such as those shadowed by buildings.

Our IRS has a structure applied the liquid crystal display technology we have developed over many years and utilizes precise liquid crystal alignment control technology with TFT. The award was given in recognition of the successful development of an IRS reported in our paper, which can switch the reflection direction of vertically incident 47GHz radio waves from 0 to 60 degrees.

This research has been supported by research grant for expanding radio wave resources (JPJ000254) of Ministry of Internal Affairs and Communications.



The recipients of the Best Paper Award  
 Daiichi Suzuki (left), Kazuki Matsunaga (center), and Mitsutaka Okita (right)  
 from Section 2, Future Elemental Technology Development Department, R&D Division



Best Paper Award Plaque

**Award Recipient**

Kazuki Matsunaga, Mitsutaka Okita, Daiichi Suzuki, Kiyoshi Tamura, Takanori Tsunashima, Shinya Asakura, Masayuki Ikari, Daijiro Takano, and Shinichiro Oka

\* International Display Workshops (IDW) is an international conference on information display technology and its applications, organized by the General Incorporated Association Display International Workshop.

\* Millimeter waves are radio waves with a frequency of 30-300GHz.

\* TFT stands for Thin Film Transistor.

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IDW: <https://www.idw.or.jp/>

YouTube: <https://www.youtube.com/watch?v=0SIXO3F9fw4>