30th NEDO Pitch “Special Issue on Cyber Security” Report (ASCII) 6/28 (Tue)
Strongest security, realized by natural decay of nuclei

The 30th NEDO Pitch was held at K-NIC in Kawasaki City, Kanagawa Prefecture in Japan. This event is a pitch event aimed at creating open innovation, co-hosted by the Open Innovation and Venture Creation Council (JOIC) and the New Energy and Industrial Technology Development Organization (NEDO). The 30th theme is “Special Issue on Cyber Security”.

■ A chip that generates random numbers using the natural decay of nuclei
Perhaps the most surprising thing on the day was the one-chip ″true random number generator″ by Quantarion.

The ″random number sequence″ used for one-time passwords and the like should be a random number, a random sequence of meaningless numbers, but it can also be regarded as a ″pseudo-random number″ as long as it is generated by software. Once the software has deciphered how it derives the sequence, it no longer makes sense as a random number.

CEO Noriyoshi Tsuyuzaki graduated from Tokyo University of Science, Faculty of Science and Engineering, Electrical Engineering, worked at the Japan Atomic Energy Research Institute, and obtained a doctorate from Ibaraki University Graduate School of Engineering.
Quantumion’s CEO, Noriyoshi Tsuyuzaki, is a graduate of Tokyo University of Science, Faculty of Science and Engineering, Electrical Engineering, working at the Japan Atomic Energy Research Institute, and has a Ph.D. in Ibaraki University Graduate School of Engineering. The company’s true random number generator operates by generating a random number by reading the pulses generated when the nucleus spontaneously decays. The company integrates these into one chip and commercializes it in a form that can be embedded in IC cards and the like. Because human decay does not involve human action, the random numbers generated by the chip are completely unpredictable and can be used to prevent hacking and spoofing.

It is expected to be used in immobilizers used in IC cards and car keys, as well as in

blockchain technology. There are already moves to collaborate with financial institutions. The amount of "alpha particle solution" encapsulated in the chip seems to be able to control the available period, and if a chip that becomes unusable after the expiration date is realized, it may be convenient for financial institutions.

Nevertheless, it is interesting to note that as a result of aiming for security, we have arrived at the invariable phenomenon of nuclear decay since ancient times.