

“Ubiquitous Echo”

As we age, various problems threaten us in turn or at the same time: obesity in childhood, diseases related to lifestyle choices in middle age, and the possibility of becoming bedridden in later years. “Ubiquitous Echo” is a new portable supersonic echo imaging equipment. It can be used to visualize key components of the body (muscles, bones, subcutaneous fat) and give fat and muscle measurements in health care or beauty facilities, or even at home. We hope that this technology will help to maintain our health and to prevent elderly people from being confined to their beds.

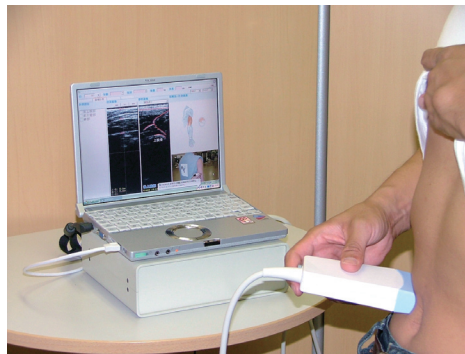


Figure 1: “Ubiquitous Echo”, a portable supersonic echo imaging equipment.

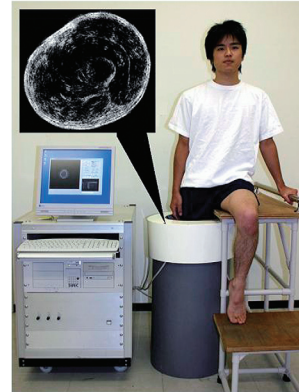


Figure 2: Cross-sectional imaging based on “Ubiquitous Echo”.

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Information Technology

Realization of 1.3 μm semiconductor laser using uniform quantum dots of high density

We fabricated a five-layered InAs quantum dot (QD) with a high density and uniformity of $1.0 \times 10^{11} \text{ cm}^{-2}$ and 23 meV, respectively, by employing an As_2 source and a gradient composition strain reducing layer. This five-layered QD laser with a 0.5-mm cavity length and cleaved facet emits 1.3 μm wavelength light at room temperature. Moreover, we could achieve a high modal gain of 43 cm^{-1} at 1.3 μm due to the high density and uniformity of the QDs.

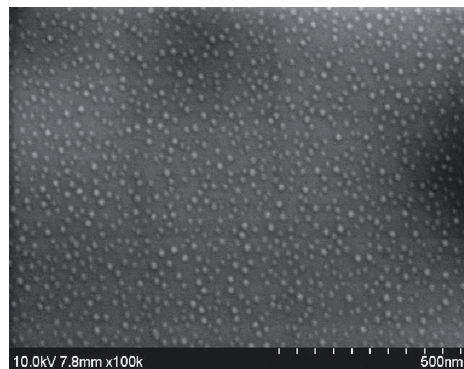


Figure 1: Surface SEM image of the quantum dots

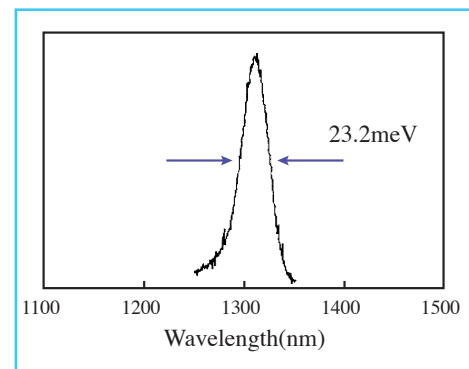


Figure 2: Emission spectrum of the quantum dots

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