

**[T-10]**

## **The characteristic carrier-Er interaction distance in Er-doped a-Si/SiO<sub>2</sub> superlattices formed by ion sputtering**

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The characteristic interaction distance between Er<sup>3+</sup> ions and carriers that excite<sup>(1)</sup> them in Er-doped a-Si/SiO<sub>2</sub> superlattices<sup>(4)</sup> is investigated. Superalattice thin films consisting of 12 period of a-Si/SiO<sub>2</sub>:Er/SiO<sub>2</sub>/SiO<sub>2</sub>:Er layers were deposited by ion beam sputtering<sup>(4)</sup> and subsequent annealing at 950°C<sup>(2),(3),(4)</sup>. The dependence of the Er<sup>3+</sup> photoluminescence(PL) intensity on the thickness of the Er-doped SiO<sub>2</sub> layers indicates that the carrier-mediated excitation efficiency decreases exponentially with a characteristic interaction distance of 0.5±0.1nm.

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