A New Doping Process in SiC at Low Temperature

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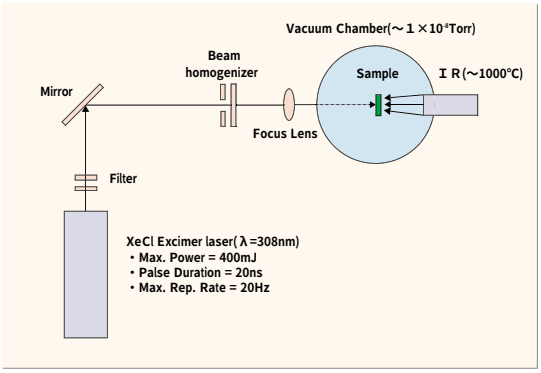
We succeeded to develop a new doping process in silicon carbide below 700°C by the excimer laser annealing combined with the thermal annealing. After irradiation of XeCl excimer laser(λ=308nm) on P^+ ion-implanted 4H-SiC sample(p-type expitaxial layer) with heating at 700°C by infrared lamp we confirmed the high electrical activation ratio of the implanted P^+ ion without the evaporation of the surface atom and the redistribution of the dopants in comparison with the case of furnace annealing at 1500°C. A minimum sheet resistance of laser annealed sample was 164.7Ω/□.



A schematic illustration of the laser annealing system

Local Plasmon Photonic Transistor by Silver Oxide Thin Film

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Recently, we found that a specially designed optical disk has the potential to amplify optical signals by surface plasmons generated over recorded marks. Since 1997, we have focused our research on super-density optical data storage specially using near-field optics and developed the novel disk structure named "super-resolution near-field structure (super-RENS)." Super-RENS was originally designed to enhance the signals of marks recorded in less than the diffraction limit. However, introducing and crossing two laser beams at one focused spot, one of the beams passing through the disk was amplified by adjusting another laser beam power. The amplifier was operated in a thin and small area in less than 100 nm and 1.0 μm.

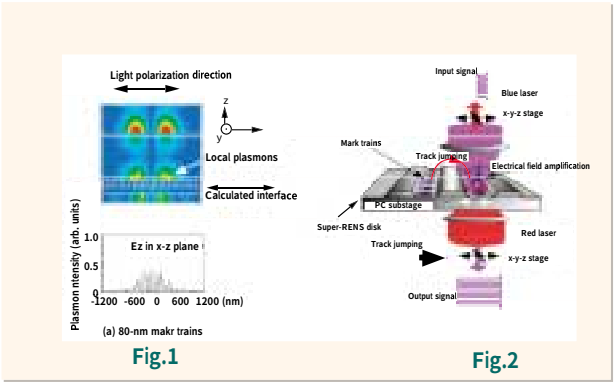

Fig.1 Fig.2

Fig.1 Plasmon reservoir by mark terains
Fi.2 Experimental setup ofplasmon transistor

J. Tominaga et al., " Local plasmon photonic transistor," *Appl. Phys. Lett.* **78** (2001) 2417-2419.