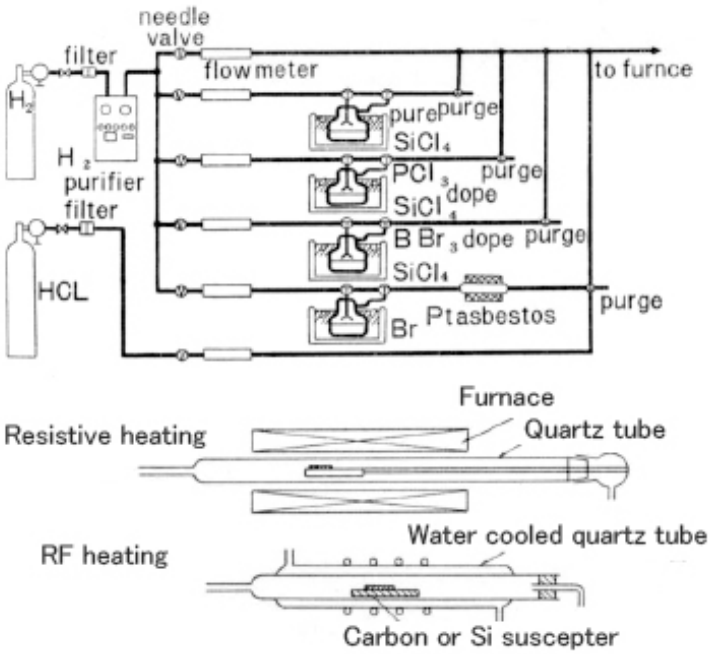
## 16 Si epitaxial growth and optical observation of the defects (Semiconductor research institute)




Si gas phase epitaxial growth system (displayed except furnace)

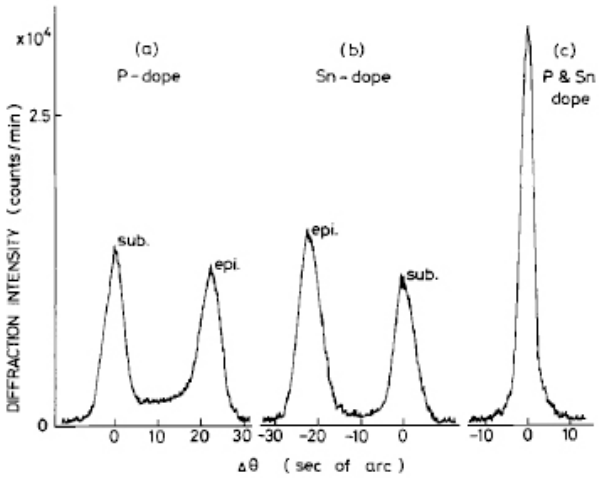



**Fig. 10.** X-ray rocking curves of $\{(511)^v, -(333)^s\}$ for compensated specimens by simultaneous doping of tin and phosphorus. (a) Phosphorus doping; $N_1 = 4 \times 10^{19}$ atom/cm$^3$; $t_f = 10\mu$. (b) Tin doping; $N_1 = 2 \times 10^{19}$ atom/cm$^3$; $t_f = 11.5\mu$. (c) Simultaneous doping of tin with phosphorus, concentrations of phosphorus and tin are $4 \times 10^{19}$ atom/cm$^3$ and $2 \times 10^{19}$ atom/cm$^3$, respectively; $t_f = 16\mu$.

## Perfect Crystal Growth of Silicon by Vapor Deposition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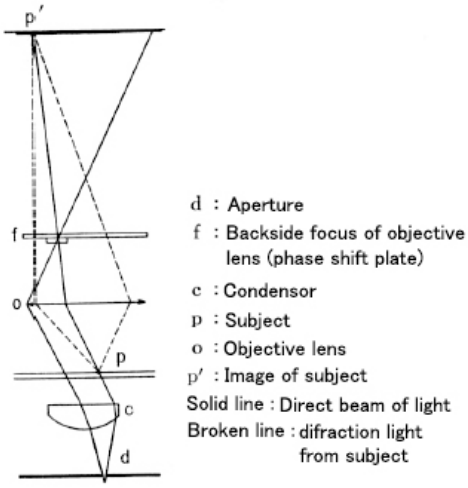
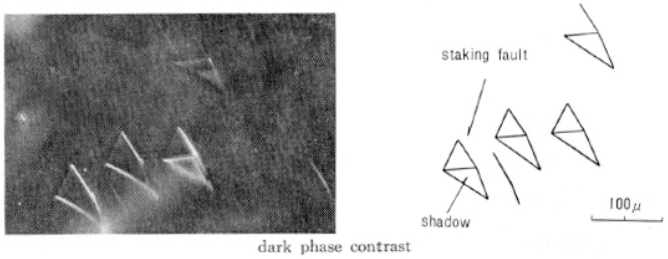


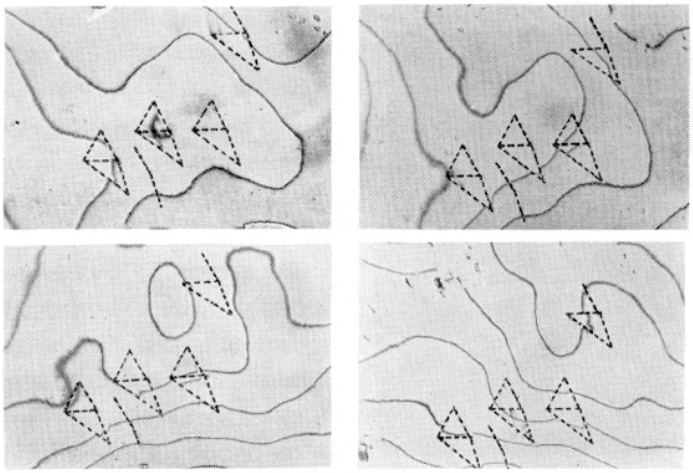

Principle of phase difference method




dark phase contrast

(a) Phase contrast image

Phase difference microscope (Reichert MEF)



(b) Multiple reflection interference images (stacking faults are observed)

(K. Terasaki : 5.Optical observation of defects、Semiconductor research 7 (1971) Kogyo Chosakai)