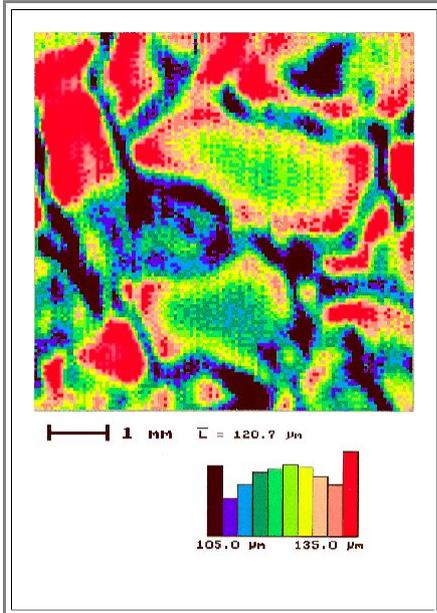


Denuded Zones along Grain Boundaries

Shown is a piece of polycrystalline Si.

Illustration



- The colors code the **minority carrier diffusion length** which is a function of the concentration of certain impurities; in this case probably iron (in the **ppb** region). Light colors (yellow, red) denote large diffusion length and low impurity concentrations, dark colors the opposite. The scale gives precise numbers.
- The grain boundaries are essentially black, because carriers will recombine there; life time and thus diffusion length is small.
- Around the grain boundaries is a red/yellow zone, showing increased diffusion length as compared to the interior of a grain. This corresponds to a decreased impurity concentration, because the iron in the neighborhood of a grain boundary has diffused to the grain boundary where it is trapped. Knowing the thermal history of the sample allows an estimate of the diffusion coefficient of iron in Si.