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POSSIBILITIES OF FORMATION OF BRIGHT EBIC CONTRASTS DUE TO CRYSTAL DEFECTS IN SILICON

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Besides the usual, well understood dark recombination contrasts, also bright EBIC contrasts can be found at extended crystal defects in silicon. Often they appear as bright haloes around dark contrasts, but sole bright contrasts are observed, too.

Different mechanisms may lead to the formation of such phenomena, thus rendering clear identification of the contrast origin difficult sometimes.

The poster discusses the possible origin of bright-contrast phenomena, except phenomena caused by microplasmas and surface structure. The following effects are illustrated by examples:
- doping inhomogeneities
  - contrast due to increased width of the junction space-charge region
  - contrast due to plasma screening
- lifetime enhancement within getter zones
- charge collection by defect-own space-charge regions
- repulsion of minority carriers by charged defects
- other, injection-dependent effects.

Up to now there are no models available to describe these contrast phenomena in a quantitative manner.