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At Which Level of Flux Density Can One Expect Dose Rate to Matter. Gerd Rosenbaum, Dept. of Biochemistry & Molecular Biology, Univ. of Georgia, B202C Life Sciences Bldg., Athens, GA 30602-7229 USA.

An order-of-magnitude estimate of the flux density is given for the onset of dose rate effects in radiation damage to cryogenically cooled samples in macromolecular crystallography. For the estimate, a “sphere of excitation” within which the final parcel of damage energy is deposited and a “de-excitation time” are assumed. Combining these with flux density and absorption coefficient, the ratio of the “excited volume” to the illuminated volume of the sample is calculated and used as a measure for the probability of dose rate effects. For plausible de-excitation times, a noticeable dose rate effect would require flux densities several orders of magnitude higher than the maximum at current 3rd generation sources.