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Spectral CT with a Timepix detector and a GaAs:Cr sensor: material decomposition

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In recent years, CT has proven itself as a method of nondestructive research in biology, geology, industry, and other fields. However, until recently, the detectors used in CT recorded only the intensity of the radiation, losing information about the energy. The method of dual-energy CT partially corrects this deficiency. With the advent of hybrid matrix detectors with the single photon counting, it became possible to take into account the energy of radiation by comparison with one or more energy thresholds. The ability to use high-Z semiconductors as a sensor makes it possible to increase the efficiency of the detector. This work is devoted to the development of a method of spectral CT with a Timepix detector and a GaAs:Cr sensor. The possibility of material decomposition based on the dependence of the linear attenuation coefficient on energy is demonstrated.

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