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Optical Transitions in Spherical NanoCrystalline Layer in the Presence of Homogeneous Electrical Field VOLODYA HARUTYUNYAN[1], Associate Professor — The nanospherical layer-type heterophase systems are of great interest primarily because they "synthesize" at the same time the properties of both quantized films and quantum dots. In this report the specifics of energy spectrum of charge carriers in the regime of "strong" quantization and electrooptical transitions in nanoradial spherical layer are theoretically observed, when the external electric field is present. The "thinness" of layer allows to suggest a simple adequate model to describe the states under which the radial and orbital motions of carriers are "separated", and the final results can be obtained in analytical form. Taking into account the specific features of energy structure the different cases of perturbation of orbital and radial motions of charge carriers are considered separately. For optical transitions the presence of field leads to change of selection rules by quantum numbers and an explicit dependence of the absorption from the effective mass of carriers appears. In the absorption strip along with the "main" resonance peak field satellites appear. The position of these satellites can be regulated by variation of geometrical sizes of sample and the field's intensity. The presence of field leads to an effective change of width of gap of the sample and consequently to short-wave shift of threshold frequency of interband and inter-subband transitions. Numerical calculations for Stark shift in the CdS/HgS/CdS structure are carried out.

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