Soliton and exciton dynamics in conducting polymers: Metric graphs based approach

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In this talk we discuss modeling of charge carrier dynamics in conducting polymers in terms of wave equations in metric graphs. In particular, we present the results on modeling of soliton dynamics in branched structures by considering Zakharov-Shabat and sine-Gortdon solitons on metric graphs. Exciton dynamics in conducting polymers will be discussed in terms of time-dependent Schrodinger equation on metric graphs. Application of the result for modeling of charge carrier dynamics in polymer and perovskite based solar cells will will be discussed.