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Two-sex, age-structured population model

The subject of the presentation is a two-sex, age-structured population model introduced first by A.Fredrickson and F.Hoppensteadt. The model consists of a system of three PDE's describing the evolution of males and females populations and the process of couples formation. The age structure plays here a crucial role, because individuals of different ages usually have different preferences for entering into a marriage. Also environmental limitations and influences are taken into consideration - a birth rate, death rate, divorce rate and marriage function depend on the state of the whole system.

Existence and uniqueness of the weak solutions in the space of nonnegative finite Radon measures equipped with a flat metric is proved. The proof bases on the operator splitting algorithm. Splitting transport terms (which describe aging and death) and boundary terms (which describe an influx of the new individuals) allows for obtaining necessary estimates. Hence, the continuous dependence with respect to time, initial data and model coefficients is proved.

REFERENCES

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