Present Migration Flows into Europe in Terms of Diffusion Theory and Gravity Model

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Abstract. The paper studies a distribution of migrants coming to Europe within present refugee crisis. It employs the method of simulation, precisely, the phenomenological theory of diffusion and gravity model employed in urban geography. After 2011 the movement of migrants was affected by building fences, negotiations of readmission agreements, instability in Libya, etc. Therefore we employ statistical data from the previous period. The diffusion of people was studied as one-dimensional transport at the solid surface without activation energy. Solutions of 2nd Fick's law applied in semiconductor technology were adapted to show that in the future, especially due to climate change, the immigration to Europe may follow diffusion from a constant (infinite) source and it may overflow the continent. The diffusion coefficient characterizing the movement of people [km^2/day] is been introduced. Simplified gravity model approach was used to find which factors, like gross domestic product, population of the country and their variations and combinations attract the migrants. A better quantification of migration phenomena in the future would need more reliable statistical data in much higher quantity.