

## A VISIT TO THE UK.

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In February 1992 I got an invitation from Professor K.Singer and Dr. W.Smith to visit UK within the frame of the CCP5 project. This invitation was quite unexpected for me, but I was glad to accept it. During many years I have the contacts with Prof. K.Singer by mail and was acquainted with his work and with work of some British research groups invoked in computer simulation of physical chemical systems on molecular level. With the help of E- mail the schedule of my two week journey was soon worked out. As I am engaged by developing and application of complex-valued Monte- Carlo method for simulation of real-time quantum dynamics and for solving the stationary problems of quantum mechanics and the theory of wave propagation on random media, my schedule included the visit to Prof. K.Singer in Egham, to Dr. W.Smith in Daresbury Laboratory, to Prof M.Payne in Cavandish Laboratory and to Dr. M.Spivack in Department of Applied Mathematic and Theoretical Physics of Cambridge university, to Dr. M.Allen in H.H.Wills Physical Laboratory (Bristol university), to Prof. P.Madden in Oxford university and the meeting with Prof. E.Jakeman from Royal Signal and Radar Establishment and Prof. M.Gillan from Keele university. As I planed I came to Heathrow on the 4th of June, where Prof. K.Singer has met me. I spent Thursday, Friday and weekend with Prof. K.Singer and his colleagues in Egham and London in very intensive and stimulating discussions. The work performed by Prof. K.Singer and Dr. W.Smith are very close to my interests, as they are engaged in developing the the stochastic numerical method for solving Wigner-Liouville equation for simulation quantum dynamics. I have extended the Monte Carlo method for calculation the Feynman path integrals allowing to describe the dynamics of quantum particles. We had long discussions about problems related to the quantum dynamics. My schedule in London was very tough, so I had very little time for sight-seeing and cultural program, but with the help and due the care of Prof. K.Singer I have seen a lot of them. I am very appreciate to Prof. K.Singer for his hospitality during my staying in his beautiful house in Egham. On Sunday I went to the Daresbury laboratory. I was met by Dr. W.Smith at the railway station. He brought me at first to hostel and then to his home, where I met extremely cordial and hospitable. On the next evenings he brought me to Chester a small town full with historical monuments. Dr.W. Smith was wonderful guide during our visit to English pub. The visit to Daresbury Laboratory impressed me greatly. Such a variety of methods, approaches and subjects of investigation. In my lecture in Daresbury I spoke about real-time quantum dynamics, sign problem connected with calculation of the Feynman path integrals and ways to solve this problem. Proposed in my papers transformation of the Feynman path integrals resulted in the new representation of the Feynman path integrals having an explicit exponential decay of the modulus of the integrand outside the dominating region. The Metropolis algorithm can be used for the calculation the Feynman integrals by Monte Carlo method in this representation. This transformation may be also useful for constructive determination of the measure for the Feynman

path integrals. The developed representation of the Feynman path integrals is already used for solving different problems of quantum physics, chemistry and the theory of wave propagation in random media. On Thursday I crossed half of Britain and left the train in Cambridge, where two hours late I gave a lecture in Cavandish Laboratory about my results on the application of developed complex-valued Monte Carlo method to the theory of quantum particles and classical wave localization in 1D, 2D and 3D random media. The Monte Carlo results showed that besides known the spatial scale of exponential decay of the mean intensity (localization length) the problem has a new spatial scale. The obtained MC results have shown that the exponential decay starts only when the distance from the source is more than this new length which is about five or six average distance between scatterers. I talked also about some other new results and the influence on the the large scale inhomogeneities on the classical wave localization and the influence of the external electrical field on the quantum electron localization. In the evening I was invited by Prof. M.Payne to the dinner in Pembroke college, where I can see the old British traditions and feel the breath of history. Next day I spent with Dr. M.Spivack, Prof. Uscinski and their colleagues in Department of Applied Mathematic and Theoretical Physics of Cambridge university. Subject of our fruitful discussions was the theory of wave propagation in random media and different approaches for solving related problems. The weekend I enjoyed the hospitality of Prof. K. Singer in his house and had wonderful excursion with him in London and country picturesque landscapes. We have also the long scientific discussions on the problem of quantum dynamics. Next two days I spent in Bristol. My host Dr.M.Allen showed me some of the sight-seeing of the town. It was very pleasant time to visit his house and met with his family. I have also many fruitful discussions with colleagues of Dr. M.Allen. After my lectures I had a meeting with Prof. E. Jakeman and we discussed some problems of the theory of wave propagation in random media and its application to the developing of the radio wave absorbers. In the evening I was invited in the Indian restaurant by Dr. M.Allen, Prof. B.Gyorffy and his colleagues, where we have a beautiful meeting. The last point of my visit was Oxford, I spent two wonderful days with my hosts Prof. P.Madden and Prof. D.Logan and their colleagues. Subject of the lectures was also the application of complex-valued Monte Carlo method and path integral technique to the problem of quantum particle localization in 1D, 2D and 3D disordered systems. I am very grateful to CCP5 project and to Prof. K.Singer and Dr. W.Smith who organized my unforgettable journey, to Prof. M.Payne, Dr. M.Spivack, Prof. E.Jakeman, Dr. M.Allen, Prof. P.Madden, Prof. D.Logan and all the colleagues for their hospitality and patience.