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EDUCATION

1992/09 – 1996/03 Ph.D. Karpov Institute of Physical Chemistry, Moscow, Russia
1986/09 – 1992/06 M.S. Department of Chemical Physics, Kazan State University, Kazan, Russia

EMPLOYMENT

2020/06 - 2020/07 Visiting scholar, RCEC, Academia Sinica, Taiwan
2016/03 - 2020/02 Visiting scholar, Genomics Research Center, Academia Sinica, Taiwan
2019/04 - present Research Fellow, Semenov Inst. of Chem. Phys., Rus.Ac.Sci., Moscow, Russia
2013/10 - 2019/03 Senior Research Fellow, Karpov Insit. of Phys. Chem., Moscow, Russia
2002/09 - 2015/07 Postdoctoral Researcher, IAMS, Academia Sinica, Taiwan
2001/01 - 2002/08 Postdoctoral Researcher, Karpov Inst. of Phys. Chem., Moscow, Russia
1996/03 - 2000/12 Research Associate, Karpov Inst. of Phys. Chem., Moscow, Russia

HONORS & AWARDS

2006, 2008, 210, 2013 Conference Travel Grant, NSC, Taiwan
1996-2001 Cooperative Grants Program funded by the U.S. the CRDF (U.S. Civilian Research and Development Foundation for Independent States of former Soviet Union) and the Russian Foundation for Basic Research (RFBR).
1995 Grant for young investigators under the International Soros Science Education Program "Soros Graduate Student". Grant No. A205-x
1992 Graduated with Honor on M.D., Kazan State University, Kazan, Russia

RESEARCH INTEREST

My current research lies in the field of studying the processes occurring in upper atmosphere/low ionosphere and concern with effects of absorption and re-emitting of radio waves by temporary arising Rydberg complexes of main atmosphere molecules. These processes directly affect to the efficiency and accuracy of GPS navigation, especially during the magnetic storms. Clear understanding and prediction of absorption and re-emitting of radio wave could significantly improve the resolution and stability of GPS devices and techniques based on it: remote sensing, radio occultation methods, climate control, ect. As a side effect of these researches is the determination of

exact composition of atmosphere of exoplanets by consideration of their emission radio spectra in addition to analysis of the absorption IR spectra.

RESEARCH HIGHLIGHTS

1. **Propagation of radio waves through D and F layers of Ionosphere**
   Physical conditions exists in the atmosphere between 60 and 110 kilometers above the Earth surface provide arising of long-life highly excited Rydberg complexes of main atmosphere molecules (N_2, O_2, NO, etc.), which is responsible for intensive absorption and re-emitting of radio waves in the GPS frequency range. This process directly affect to the efficiency and accuracy of GPS navigation, especially during the magnetic storms. That is why understanding and prediction of processes occurring in the low ionosphere could significantly improve the resolution and stability of GPS devices, as far as techniques based on it: remote sensing, radio occultation methods, climate control, ect. Another possible application of these researches is investigation of composition of exoplanet's atmosphere by their emission radio spectrum.
2. **Photoionization and photodissociation processes of single molecules under irradiation**
   Theoretical and experimental study of excitation, ionization, and dissociation processes occurring with molecules under the influence of various kinds of radiation are an important task for determination of composition of various gas mixtures, in particular, atmosphere and interstellar medium. Understanding of physical and chemical processes occurring in organic and inorganic molecules under irradiation also can explain the influence of UV and other kind of radiation on biomolecules, as far as formation, changes and destruction of various atmosphere pollutions. One of important application of theoretical investigations mentioned above is explanation and prediction of experimental mass spectra, obtain by various methods: VUV photodissociation, electron impact (IE), collisionaly induced dissociation (CID), MALDI (Matrix-Assisted Laser Desorption/Ionization), and others.
3. **Theoretical and experimental study of structure, as far as biological, physical, and chemical properties of various kinds of nano- and microparticles**
   Investigation of structure and properties of nano- and microparticles of different size and compositions is one of important scientific area, which explain creation and evolution of various particles in low and upper atmosphere, as far as describe their interaction with living organisms.
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REPRESENTATIVE PUBLICATIONS (*: corresponding author)

1. Golubkov, G.V., Manzhelii, M.I., Berlin, A.A., Eppelbaum, L.V., Lushnikov, A.A., Morozov, I.I., Dmitriev, A.V., Adamson, S.O., **Dyakov, Y.A**., Morozov, A.N., Golubkov, M.G.* The Problems of Passive Remote Sensing of the Earth's Surface in the Range of 1.2–1.6 GHz. Atmosphere, V. 11 (2020), No11, 650. DOI:10.3390/atmos11060650.

2. Kuverova, V.V., Adamson, S.O., Berlin, A.A., Bychkov, V.L., Dmitriev, A.V., **Dyakov, Y.A.**, Eppelbaum, L.V., Golubkov, G.V., Lushnikov, A.A., Manzhelii, M.I., Morozov, A.N., Nabiev, S.S., Shapovalov, V.LSuvorova, A.V., Golubkov, M.G.* Chemical physics of D and E layers of the ionosphere. Advances in Space Research, V. 64 (2019), P. 1876–1886. https://pubs.acs.org/doi/10.1021/acs.jpca.8b11908
3. Golubkov, G.V., Bychkov, V.L., Gotovtsev, V.O., Adamson, S.O., **Dyakov, Y.A.**, Rodionov, I.D., Golubkov, M.G.* Glow of Heavy Dust Particles in Earth's Atmosphere During an Earthquake. Russian Journal of Physical Chemistry B, V. 14 (2020), No2, P. 351-354. DOI: 10.1134/S1990793120020219.
4. Adamson, S.O., Kharlampidi, D.D., Nabiev, S.S., Golubkov, G.V., **Dyakov, Y.A.**, Golubkov. M.G. Ab initio Calculations of the Lowest 1Σ+g states of Na2 dimer. Russian Journal of Physical Chemistry B, V. 14 (2020), No2, P. 235-242. DOI: 10.1134/s1990793120020165.
5. **Dyakov, Y.A.**, Kurdyaeva, Y.A., Borchevkina, O.P., I.V. Karpov, Adamson, S.O., Golubkov, G.V., Olkhov, O.A., Peskov, V.D., A.I. Rodionov, Rodionova, I.P., Shapovalov, V.L., Shestakov, D.V., Golubkov M.G.* Vertical Propagation of Acoustic Gravity Waves from the Lower Atmosphere during a Solar Eclipse. Russian Journal of Physical Chemistry B, V.14 (2020), No.2, P. 355-361. DOI: 10.1134/S1990793120020207.
6. Wang, Z., **Dyakov, Y.A.**, Bu Y.* Dynamics Insight into Isomerization and Dissociation of Hot Criegee Intermediate CH3CHOO. J. Phys. Chem. A, V. 123 (2019), pp.1085−1090. https://doi.org/10.1021/acs.jpca.8b11908
7. **Dyakov, Y.A.*;** Ho, Y.C.; Hsu, W.H.; Ni, C.K.*: Excited States Dissociation Dynamics of Indole-x-Carboxaldehyde (x = 4, 5, 6, 7): Theoretical and Experimental Study. Chemical Physics. V. 515 (2018), P. 543-549. https://doi.org/10.1016/j.chemphys.2018.09.019
8. **Dyakov, Y.A.**, Toliautas, S., Trakhtenberg, L.I., Valkunas L.* Excited state photodissociation dynamics of 2-, 3-, 4-hydroxyacetophenone: Theoretical study. Chemical Physics, V. 515 (2018), p. 672-678. https://doi.org/10.1016/j.chemphys.2018.07.020
9. Lu, I.C., Chu, K.Y., Lin, C.Y., Wu, S.Y., **Dyakov, Y.A**., Chen, J.L., Gray-Weale, A., Lee, Y.T., Ni, Chi-Kung*. Ion-to-Neutral Ratios and Thermal Proton Transfer in Matrix-Assisted Laser Desorption/Ionization. J. AM. SOC. MASS SPECTROMETRY, 26 (2015), p. 1242-1251. DOI: 10.1007/s13361-015-1112-3
10. Lu, I.C., Lee, C., Chen, H.Y., Lin, H.Y., Hung, S.W., **Dyakov, Y.A**., Hsu, K.T., Liao, C.Y., Lee, Y.Y., Tseng, C.M., Lee Y.T., Ni. Chi-Kung.* Ion Intensity and Thermal Proton Transfer in Ultraviolet Matrix-Assisted Laser Desorption/Ionization. J. Phys. Chem. B. V.118, No 15, P. 4132-4139 (2014). DOI: 10.1021/jp5008076

11. Chu, K.Y., Lee, S., Tsai, M.T., Lu, I.C., **Dyakov, Y.A**., Lai, Y.H., Lee, Y.T., Ni, C.K.* Thermal Proton Transfer Reactions in Ultraviolet Matrix-Assisted Laser Desorption/Ionization. J. Am. Soc. Mass. Spec. 25 (2014), p. 310-318. DOI: 10.1007/s13361-013-0792-9
12. Wang, Q.Q., **Dyakov, Y.A**., Wu, D., Zhang, D.D., Jin, M.X., Liu, F.C., Liu, H., Hu, Z., Ding, D.J., Mineo, H., Teranishi, Y., Chao., S.D., Lin, S.H., Cheng, X.H., Kosheleva, O.K., Mebel, A.M.* Ionization/Dissociation Processes of Methyl-Substituted Derivates of Cyclopentanone in Intense Femtosecond Laser Field. Chem. Phys. Lett. 586 (2013), p.21-28. DOI: 10.1016/j.cplett.2013.09.009
13. Hsu, H.C., Tsai, M.T., **Dyakov, Y.A.**, Ni, C.K. Alkylation Effects on the Energy Transfer of Highly Vibrationally Excited Naphthalene. Chemistry-An Asian Journal, V. 6 (2011), 3048-3053. DOI: 10.1002/asia.201100314
14. **Dyakov Y.A.**, Bagchi, A., Lee, Y.T., Ni*, C.K. (2010): Photodissociation dynamics of benzoic acid. J. Chem. Phys. 132, Art. No. 014305. https://doi.org/10.1063/1.3274624
15. **Dyakov, Y.A.***; Mebel, A.M.; Lin, S.H.; Lee, Y.T.; Ni, C.K. Photodissociation of 1,3,5-triazine: An ab initio and RRKM study. J. Phys. Chem. A. 111, (2007), P. 9591-9599. https://doi.org/10.1021/jp0740649
16. Sharifi, M., Kong F., Chin, S.L., Mineo, H., **Dyakov, Y**., Mebel, A.M., Chao, S.D., Hayashi, M., Lin, S.H.* Experimental and theoretical investigation of high-power laser ionization and dissociation of methane. J. Phys. Chem. A111 (2007), 9405-9416. https://doi.org/10.1021/jp074053f
17. **Dyakov, Y.A. ***, Ni, C.K., Lin, S.H., Lee, Y.T., Mebel, A.M. (2006): Ab initio and RRKM study of photodissociation of azulene cation. Phys. Chem. Chem. Phys. 8, 1404-1415. https://doi.org/10.1039/B516437K
18. **Dyakov, Y.A.*,** Ni C.K., Lin S.H., Lee Y.T., Mebel*, A.M. (2005): Photodissociation of azulene at 193 nm: Ab initio and RRKM study. J. Phys. Chem. A. 109, 8774-8784. https://doi.org/10.1021/jp053218m
19. Zyubina, T.S., **Dyakov Y.A**., Lin., S.H., Bandrauk, A.D., Mebel, A.M.* Theoretical study of isomerization and dissociation of acetylene dication in the ground and excited electronic states. J. Chem Phys. 123 (2005), Art. No. 134320. https://doi.org/10.1063/1.2050649
20. Tseng, C.M., **Dyakov, Y.A**., Huang, C.L., Mebel, A.M., Lin, S.H., Lee, Y.T., Ni, C.K.* Photoisomerization and photodissociation of aniline and 4-methylpyridine. J. Am. Chem. Soc. 126 (2004), p. 8760-8768. DOI: 10.1021/ja0120678.

Others (Invited Talks，Keynote speech et al.)