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Department of Justice
Immigration and Nationalization Services

To Whom it May Concern:

Re: Letter of recommendation to grant Immigration to Dr. Zhongyan Lin under the Catego
of Professionals with Extraordinary Ability

This letter is written to support the application of Zhongyan Lin for immigration to the United States under a special category of professionals with extraordinary ability or outstanding researcher. I hold the Unidel Chair for Mathematics and Computer Science at the University of Delaware. I am the author of over 200 research papers, and the author of 6 research monographs. I am Editor-in-Chief of the two mathematics journals APPLICABLE ANALYSIS and COMPLEX ANALYSIS; moreover, I am on the editorial boards of 12 other research journals. I first met Lin when I was visiting China. He impressed me at that time with his sharp mind and we started a joint collaboration on a paper during my visit. I was so impressed with him that I recruited him right away to come and finish his Ph. D. with me at Delaware. He had participated in several important mathematical research and engineering design projects in China and had written several very good papers in that field before coming to work with me. We wrote one paper together on inverse problems before I started him on computational acoustics. Dr. Lin wrote an brilliant Ph. D. thesis under my direction on computational acoustics and inverse problems for mathematical physics. Dr. Lin and I collaborated subsequently on numerous research efforts and published jointly eight papers. Dr. Lin's research was mainly concerned with computational acoustics for shallow ocean with an interactive seabed, and the undetermined coefficient problems for partial differential equations. These are ill-posed problems, and very difficult. He is working in areas that are very important to industry and national security. The direct application of his work is for the detection of mines that might be placed in a harbor. The same technology developed in his research is of use in determining the nature of the sea-bed, which can be used in the many areas such as prospecting for off-shore petroleum and gas, and constructing drilling platforms. His research, which is related to non-destructive evaluation (NDE), has numerous commercial, defense, and health applications. For

example, non-destructive evaluation is being used to evaluate aged aircraft in the Air Force, and inverse scattering is of potential use in medical diagnoses. Lin has accomplished an immense amount in the area of computational acoustics. He is a great problem solver, in particular, in the area of partial differential equations involving inhomogeneous media and non-constant coefficients. This is because he has a solid and extensive training in mathematics, physics and computer science. He specializes in both theoretic approaches and numerical methods. He can design and implement the most efficient algorithms for many challenging problems. Because of his excellent work, now we have several effective ways for computing the acoustic field in a shallow ocean. This includes various types of sea-beds, with various sound sources, and also with objects embedded in the sea-bed. His research in this field has components which vary from abstract mathematics such as functional analysis to the implementation of these ideas in the terms of very large computer codes. His codes were run on the Cray at Pittsburgh and were very successful for determining unknown objects such as submarines and/or mines. Lin's research is on the cutting edge of modern computational acoustics, and Navy applications of these methods. His code for a full three-dimensional acoustic field generated by scattering an illuminating signal is state of the art. There are few scientists in the world today who have the command not only of an exquisite knowledge of scientific computation but also the command of abstract mathematics to permit a break through in the field of inverse acoustic problems in an ocean environment. Dr. Lin's work in inverse problem is also outstanding. His recent paper "On the determination of radially dependent Lame coefficients" has caught great attention among the researches in this field. This long paper published in SIAM Journal on Appl. Math., one of the best journals in the field, proves a very important theorem in the area of non-destructive evaluation and the method he established has a potential for solving numerous problems in the field. His results is one of best results on inverse problem in recent years. Because Dr. Lin is a very active researcher, he was asked to review submitted papers for publication and international conference many times. Lin also has an advanced degree in Computer Science. His combined knowledge of acoustics, and computer science and information systems make him a great asset to our country for the development of technology and hence also the economy of our nation as a whole. Dr. Lin is an excellent applied mathematician and outstanding researcher. And he is clearly the best Ph.D. student I have had in 40 years of graduate teaching! At this time Dr. Lin is employed in the aeronautic and automatic control industry and his knowledge of inverse problems and acoustics can be easily transferred to identification of objects, collision avoidance, noise control and other automatic control, which of course are of great importance to that industry. It is indeed rare when a researcher such as Zhongyan Lin appears on the scene. Not only is he a highly gifted, and well trained computational-mathematician, he has, an extraordinary knowledge of mathematical physics. Currently, I am particularly interested in collaborating with him to solve more inverse scattering problems. This efficient solving of this problem is of great importance for National security. There will always be a contest between potential aggressors and the scientist who strive to protect our shores. It is necessary that we keep a monopoly of those scientists here in our country. With this object in mind, I recommend that you give serious attention to considering Dr. Zhongyan Lin for special waiver of Labor Certification. Dr. Lin is an outstanding scientist and is

capable of making great contributions to the National security. The future of our country will be greatly enhanced by allowing him to continue his work in his chosen field. Consequently, I enthusiastically support his application for immigration in the category of professionals with extraordinary ability and outstanding researchers. If you have any further questions please do not hesitate to contact me (302) 831-2315 or FAX (302) 831-4456.

Sincerely,

Robert P. Gilbert

Robert P. Gilbert
Unidel Chair for Mathematics and Computer Science
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