Dissertation Review Form
-for members of the Dissertation Commission-

Please write a review of the dissertation taking the following criteria into account, where appropriate:

- General remarks
- The significance and status of the dissertation in the field
- The sufficiency and quality of the material
- The adequacy of the methods used
- The validity of results
- The logic of the dissertation's structure
- The knowledge and use of literature in the field
- The project's contribution to the research area
- The author's input into the achievement of the dissertation results
- Language
- The shortcomings of the manuscript

Name of the PhD Candidate :Mr. ALEKSANDR MKRTCHYAN
Planned Date of Graduation : 13 October, year: 2015

Title of the Dissertation: CONTINUATION OF POWER SERIES BY ENTIRE AND MEROMORPHIC INTERPOLATION OF COEFFICIENTS

Theory of analytic functions is notable for its numerous applications not only in mathematics but in science too.

The problem of analytic continuation of a power series beyond its domain of convergence is the first classical example of an ill-posed problem that gave rise to mathematical methods of geophysics and medical diagnostics. A wide range of applications related to this problem provides a stable interest to it.

After deep and exhaustive results obtained by Hadamard, Polya, and other great mathematicians since the second half of the 19 century, to advance in studying this relevant problem is a difficult task that demands a sharp mind and highest qualification.

In the first chapter the problem of analytic continuation of a power series in one variable is studied. This problem has three different settings, considered before that by Polya and Arakelian. They solved the problem by proving existence of an associated entire function interpolating the coefficients of a given series, with some conditions on its growth indicator. In the thesis for a power series there introduced a meromorphic interpolating function of a certain type. For this function, in its turn, there is an associated entire function. Then the answers to questions related to continuation are formulated as sufficient conditions on the growth indicator of the latter. Also, examples showing why this interpolation is more effective are given.

In the second chapter the author studies analytic continuability of a multiple power series beyond the boundary of its polydisc of convergence. Here A.Mkrtchyan establishes a necessary and sufficient condition for continuability across a family of poly-arcs, and also, conditions for continuability in a poly-sectoral domain of complex multidimensional space.

The thesis under review has great merits. Theorem 2.1 gives a rather non-trivial necessary and sufficient condition for analytic continuability of a multiple power series across a family of poly-arcs in terms of an entire function that interpolates the coefficients of the series. In the proof the author demonstrates a good grasp of the methods of modern complex analysis. The main results of the thesis are explicit and constructive; in some model cases they allow computer-assisted verification.

There are some shortcomings in the manuscript. For example, the condition of Theorem 2.4 on uncontinuability of a double power series beyond a unit bidisc, formulated in terms of the support of the series, might be significantly strengthened. Also, sufficiency of multidimensional lacunarity of series' support that guarantees uncontinuability of a series across its natural boundary was left beyond the scope of the thesis. However, these questions may be the topic of further studies of the author. There are several minor misprints in

the thesis, they do not hinder understanding, nor they belittle the importance of the results.

All results of the thesis are supplied with clear and correct proofs, often being illustrated, that testifies to high academic qualifications and great erudition of the applicant.

To my opinion, the material of this thesis is of a very high quality and it is sufficient for the author to be awarded the PhD degree.

Name of the Dissertation Commission Member : Safonov Konstantin

Chair / Function : **Chair of Theory of Function**

Date : **05.10.2015**

Signature : ....

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Please send the completed form to the Head of the office of the Doctoral and Post-doctoral, Faculty Performance Evaluation Office Grigorieva O.A. e-mail:grigorieva_00@mail.ru, tel. +7 (391) 206-22-62, address: 79/10 Svobodny pr., Room P6-16, 660041 Krasnoyarsk, Russia