

## Thesis Changes Log

**Name of Candidate:** Andrii Liashyk

**PhD Program:** Center for Advanced Studies

**Title of Thesis:** Bethe vectors and their scalar products  
in quantum integrable models

**Supervisor:** Prof. Anton Zabrodin

**Chair of PhD defense Jury:** Prof. Andrey Marshakov

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**Date of Thesis Defense:** 20 January 2020

*The thesis document includes the following changes in answer to the external review process.*

Dear Reviewers,

I would like to thank you for the useful comments which were invaluable in improving the thesis. Below please find the responses.

Yours sincerely,  
Andrii Liashyk

**Reviewer: Prof. Ivan Kostov**

Comment1: "Small linguistic issues (already communicated to the Author) to be fixed."

Response1: Corrected.

Comment2: "Although this chapter covers all the essential notions and techniques used in this Thesis and demonstrates comprehensive understanding of the subject, its minimalist style renders it accessible only for readers already familiar with the mathematical aspects of the quantum inverse scattering method."

Response2: I added a definition of the most fundamental concepts of quantum integrability. I also added some references to very good lectures on introduction to Algebraic Bethe Ansatz. In addition, I tried to explain in more detail the most crumpled places in the text.

Comment3: "The part of the Introduction concerning the Yangian Double is too sketchy. It is necessary at least to explain what specifies the two components of the Yangian double,  $T^{+}$  and  $T^{-}$ , and how they are related."

Response3: In section 1.1, I added a definition of Yangian algebra and nice references. In section 1.4 (about the Bethe vector), I separately specify the role of the two monodromy matrices  $T^{+}$  and  $T^{-}$ . In section 1.4, I also added a definition of the Bethe vector, an short description of the different realisation of the Yangian, the relationship between them, and some explanations for the construction of the Bethe vector.

Comment4: "There are also some stylistic imperfections to be addressed."

Response4: I reformulated the most awkward points and added explanations and motivations to make those points clearer.

Comment5: "The bibliography should be completed."; " The bibliography of 27 references is far from being complete."

Response5: I added references to all the places you specified. I added references to all the places you specified. Also I added references in all places where it can help to understand introduction on my opinion. Thus, I increased the number of refences in the introduction from 27 to 65.

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**Reviewer: Prof. Andrey Pogrebkov**

Comment: "To my regret English presentation should be improved."

Response: I do my best. After your comment, I read the thesis again few times and corrected some grammatical mistakes.

