

## I. IDENTIFICATION DATA

<b>Thesis name:</b>	Optimization of Machine Learning for the Leptoquark Search using CERN ATLAS Data
<b>Author's name:</b>	Janick Boehm
<b>Type of thesis :</b>	bachelor
<b>Faculty/Institute:</b>	Faculty of Electrical Engineering (FEE)
<b>Department:</b>	Department of Cybernetics
<b>Thesis supervisor:</b>	Doc. Dr. André Sopczak
<b>Supervisor's department:</b>	IEAP CTU in Prague

## II. EVALUATION OF INDIVIDUAL CRITERIA

<b>Assignment</b>	<b>challenging</b>
The assignment has been challenging as the task was carried out in the large environment of the ATLAS collaboration. The student had to become familiar with the data format of ntuple and Root as major tools. The separation of signal and background poses further technical challenges regarding preselection and visualization of results with standard tools like Trexfitter.	

<b>Satisfaction of assignment</b>	<b>fulfilled</b>
All tasks are fulfilled.	

<b>Activity and independence when creating final thesis</b>	<b>A - excellent.</b>
The student has a very good ability to perform independent research work. He was always well prepared for consultations, came up with new ideas and followed advice.	

<b>Technical level</b>	<b>A - excellent.</b>
The use of knowledge and expert literature was very good. He expanded his experience with large data processing and he mastered working in a new environment with software packages which were new to him.	

<b>Formal and language level, scope of thesis</b>	<b>B - very good.</b>
The thesis is well written has a high standard. The formal use of many new notations and providing definitions is adequate.	

<b>Selection of sources, citation correctness</b>	<b>B - very good.</b>
Source citations are correct and meet the standard. The given citations are relevant and the format is consistent.	

<b>Additional commentary and evaluation</b>
The scientific goals have been achieved in his study of Leptoquarks. The developed software is useful for advancing the search further in the future. Once the analysis based on simulations is finalized and frozen, the selection will be applied on recorded data and the actual discovery or limit setting will be made.

## III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

The student was very motivated and worked independently, his result were validated and he presented them at CERN meetings, and at the student session of the German Physical society meeting in Dresden in March 2023.

I evaluate handed thesis with classification grade **A - excellent.**

Date: **7.6.2023**

Signature: