

I. IDENTIFICATION DATA

Thesis name:	Simulace optických přenosových systémů v prostředí OptSim
Author's name:	Kevin Aguilar
Type of thesis :	master
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Circuit Theory
Thesis supervisor:	Dr. Michal Lucki
Supervisor's department:	Department of Telecommunication Engineering

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	challenging
<i>Evaluation of thesis difficulty of assignment.</i>	
The task was numerical simulations of high-speed optical transmission systems of investigative character. The presented thesis is highly topical. I consider the assignment to be demanding on average.	

Satisfaction of assignment	fulfilled
<i>Assess that handed thesis meets assignment. Present points of assignment that fell short or were extended. Try to assess importance, impact or cause of each shortcoming.</i>	
Mr. Aguilar performed simulations of the selected optical systems with focus on their implementation limits and potential extensions, according to the thesis assignment and showed a number of unique results and practical conclusions on how to upgrade optical systems towards terabit transmission rates. I consider the goals of the work as fulfilled .	

Activity and independence when creating final thesis	A - excellent.
<i>Assess that student had positive approach, time limits were met, conception was regularly consulted and was well prepared for consultations. Assess student's ability to work independently.</i>	
Mr. Aguilar is a very responsible student who showed involvement confirmed by his excellent skills and deep theoretical knowledge. I emphasize his academic skills and ability to solve technical problems. He participated in all the planned meetings with the supervisor. He can work independently and has demonstrated an engineering approach to the thesis.	

Technical level	A - excellent.
<i>Assess level of thesis specialty, use of knowledge gained by study and by expert literature, use of sources and data gained by experience.</i>	
The main focus of the work is to use the methods of scaling the capacity of optical systems in order to solve potential shortcomings and extend their reach and capacity towards Terabits. One of the tools is the use of the most suitable modulations, performing careful power balance, avoidance of nonlinear effects, as well as grid optimization. The results showed potential of existing physical layer and were optimized to reach the unavoidable physical limits. The work of Mr. Aguilar can potentially facilitate a systematic approach to network planning and any upgrades. It assesses deep theoretical knowledge of the student, as there is no space for any trial-error procedures or unoptimized margins, if you want to reach extremely high bit-rates. Very interesting findings (among many others) are ones about long-haul systems with the reach even above 4500 km (Subchapter 5.5), where it is shown that through optimization it is possible to extend the reach to 9000 km while keeping the bit-rate around 0.5-1 Tbps! This is extraordinary.	

Formal and language level, scope of thesis	A - excellent.
<i>Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.</i>	
The work is written in English, it is well readable (Mr. Aguilar is a native speaker). It is accompanied by a number of diagrams and figures of a high quality and resolution. The terminology used is correct; abbreviations are introduced in a correct way. The use of academic and scientific language prove that the author is proficient in optics.	

Selection of sources, citation correctness

A - excellent.

Present your opinion to student's activity when obtaining and using study materials for thesis creation. Characterize selection of sources. Assess that student used all relevant sources. Verify that all used elements are correctly distinguished from own results and thoughts. Assess that citation ethics has not been breached and that all bibliographic citations are complete and in accordance with citation convention and standards.

As references, the student primarily used indexed professional journal and conference papers, and ITU standards. The references are up to date and of a high-quality. The state of art, the related works are cited are referenced in a proper way and the references are numbered in the correct order. The formatting is uniform. The used elements are clearly distinguished from Mr. Aguilar's own results.

III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

Summarize thesis aspects that swayed your final evaluation.

The most influential aspect of overall assessment is the quality of the results; the work is excellent.

I **recommend** the work of Mr. Kevin Aguilar to the defense.

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

Date: **5.6.2019**

Signature: Dr. Michal Lucki