

INFORMATION ON DOCTORAL DISSERTATION

Title of Thesis:

RESEARCH ON HYBRID TRANSMISSION TECHNOLOGIES BASED ON FSO, MMW AND OPTICAL FIBER FOR MOBILE BACKHAUL NETWORKS

Specified field of study: **Telecommunication Engineering**

Code of specialty: **9.52.02.08**

Name of PhD candidate: **Pham Vu Minh Tu**

Committees:

1. Assoc. Prof., Dr. **Dang The Ngoc**
2. Assoc. Prof., Dr. **Vu Van San**

Academic Institution: Posts and Telecommunications Institute of Technology

NEW RESULTS OF THE DISSERTATION:

1. Proposing to use network coding for a two-way dual-hop mixed free-space optics (FSO)/radio frequency (RF) systems in order to enhance performance of mobile backhaul networks.
2. Proposing high-capacity backhaul solutions based on wavelength-division multiplexing (WDM) optical passive network (PON) with deployment scenarios that are pure WDM-PON; hybrid FSO/WDM-PON and hybrid MMW/WDM-PON.
3. Developing a mathematical model for the design and performance analysis of the hybrid FSO/WDM-PON-based backhaul networks impaired by four-wave mixing (FWM) effect.

APPLICATION AND USED IN THE REAL WORLD OR FUTURE WORKS

The thesis has proposed new theoretical and analytical models to evaluate performance of hybrid FSO, MMW and fiber-optic transmission systems for mobile backhaul networks. For the future works, the research outcomes of the thesis can help to design and evaluate of the feasibility of hybrid FSO, MMW and fiber optic backhaul systems. In addition, these research results can also be applied in teaching and research at universities.

Research supervisors

PhD. candidate

Assoc. Prof., Dr. Dang The Ngoc

Pham Vu Minh Tu