

**SUMMARY ON SCIENTIFIC AND THEORETICAL  
CONTRIBUTIONS OF DOCTORAL THESIS**

1. Title: Research on currents in tonkin gulf by using data assimilated from hf radar and numerical model.  
- Major: Oceanography  
- Code: 9440228

2. PhD student: Nguyen Thanh Trang

Supervisor: Assoc. Prof Pham Văn Huan; Dr. Tran Hong Lam

Institution: Viet Nam Institute Of Meteorology, Hydrology And Climate Change

3. Introduction of thesis:

Thesis has applied an assimilation technique to insert HF marine radar data into the regional ocean modeling system (ROMS) to simulate and analyze the flows in Tonkin Gulf. By applying R4D-Var method to assimilate HF radar current data based on the regional ocean modeling system (ROMS). Results reveals that the ROMS output of assimilation contributes to increasing the accuracy of simulation for surface currents in Tonkin Gulf, evaluating then spatial and temporal characteristics of flows in Tonkin Gulf to promote the efficiency of HF radar exploitation.

4. *List of new contributions of thesis*

- Using 4D-Var assimilation technique and ROMS model to improve efficiency of HF radar exploitation in Viet Nam and enhance reliability of reanalysis results for flows in Tonkin Gulf

- Evaluate the monthly-averaged current 3D-field in the Gulf of Tonkin

based on analysis and simulation results from re-analyzed data of ROMS model and remote sensing data.

**Supervisor**

**PhD student**



Assoc Prof. Pham Van  
Huan



Dr. Tran Hong Lam



Nguyen Thanh Trang