

**DOCTORAT DE L'UNIVERSITE DE LILLE 1 SCIENCES ET TECHNOLOGIES**

**N° order :**

**NAME/SURNAME OF THE CANDIDATE : DUPUIS MATTHIEU**

Doctoral School : SMRE

Laboratory : LOG

Discipline : Geology

In case of co-tutorial thesis, provide the partner institution :

**THESIS COMMITTEE :**

- Thesis supervisor(s) : VENDEVILLE Bruno
- Referees : LONCKE Lies / DEVILLE Eric
- Examiners : TRIBOVILLARD Nicolas / LACOSTE Aurélien / RIBOULOT Vincent

**DEFENSE : (06/27/2017, 2pm, IEMN)**

**TITLE OF THE THESIS :**

Occurrence and growth of mud volcano systems.

**ABSTRACT :**

This doctoral work studies the mechanisms involved in the growth of mud volcanoes systems and the processes involved with their surface evolution. The study is based on a structural analysis using seismic data acquired on two anticlines located in the NW of the South Caspian Basin and on an extensive structural field work combined with a sub-surface imagery based on electrical resistivity and geochemical analysis on edifices located on the onshore in continuity of the Kura Basin (Azerbaijan).

Mud volcano systems represent a continuum from the overpressure source at depth up to the surface edifice, with in between, a fluid-migration path more or less complex comprising zones of mud generation and zones of storage of this material.

Mud Pie are edifices having a flat morphology induced by the occurrence of a reserve of liquid mud on surface that we call Superficial Chamber. The input of material from a shallow mud source induce the inflation of this chamber which, reaching the equilibrium, induces a compressional stress that deform the edifice and make it grow, following a model named "Pushing Walls". Conical edifices are linked to deeper storage zones (Secondary Chamber) or even to the source of mud itself (Primary Chamber). The fluid source (water and gas) is clearly disconnected to the source of mud.

Sedimentation plays a dominant role on mud volcano systems evolution allowing to seal the fluid migration paths, thus the formation of fluids overpressure, inducing an evolution by successive pulses leading to interlocked mud volcano systems: mud volcano systems complexes.