



Thesis Project Form

Title (tentative): Experimental study of silicon oil emulsification in a model of the human eye

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Description

Motivation and application domain

Vitrectomy is a surgical procedure during which the vitreous humour is removed from the eye and replaced by tamponade fluids. One such fluid that is used for long term tamponating effect is silicone oil (SO). The main risk associated with the use of SO is its tendency to emulsify in water, especially in the presence of surface active molecules. Aim of the thesis is to understand the role of blood serum proteins on the emulsification process.

General objectives and main activities

The main objective of the work is to understand the role of blood serum proteins on the emulsification process. We will use a physical 3D model of the human vitreous chamber that will be filled with SO and an aqueous solution containing serum proteins. The model will be set in motion to replicate eye rotations and the temperature will be kept constant at approximately body levels.

Training Objectives (technical/analytical tools, experimental methodologies)

The student will learn experimental techniques and image post processing methods.

Place(s) where the thesis work will be carried out: ICMATE CMR

Additional information

Pre-requisite abilities/skills: Basic knowledge of fluid mechanics

Maximum number of students: 1