# Fundamentals of Coherent Photonics
## Lab Reports

**Andrew Simon Wilson & Alejandro Dominguez Costa**

21st December, 2021



EMIMEO Programme
Module Coordinator: Dr. Philippe Di Bin & Dr. Rafael Jamier

# Author Details

## Andrew Simon Wilson, BEng

**Post-graduate Master's Student, Erasmus Mundus JMD - EMIMEO Programme**

@ andrew.wilson@etu.unilim.fr        in andrew-simon-wilson        AS-Wilson        +44 7930 560 383

# Co-Author Details

## Alejandro Dominguez Costa

**Post-graduate Master's Student, Erasmus Mundus JMD - EMIMEO Programme**

@ aledomcos11@gmail.com        +34 622 61 19 50

# Contents

# Introduction

A lot of time has been spent developing the template used to make this LaTeX document, I want others to benefit from this work so the source code for this template is available on GitHub [**?**].

# 1   Lab One - Optical Fibres Splices & Losses

## 1.1   Measurement One: Observation and Cleaning of the FC-PC Connectors

Given that the core diameter is $125\mu$m the core is estimated to be around $50\mu$m in diameter ($25\mu$m in radius) meaning this is likely a multi-mode fibre.

After touching the end of the connector with ones finger, dirt and oil can be seen and the light is not propagating clearly.

Given that the core diameter is $125\mu$m the core is estimated to be around 5 $10\mu$m in diameter meaning this is likely a single-mode fibre.

## 1.2   Measurement Two: Light Injection into an Optical Fibre

## 1.3   Measurement Three: Study of the Operation of the Thorlabs Optical Power Metre

### 1.3.1   Calibration of the Power Metre

### 1.3.2   Measurement of Power Variation or Losses Using the "Power Difference $\triangle$" Mode of the Power Metre

## 1.4   Measurement Four: Realisation of a Splice between Two Multi-mode Fibres

## 1.5   Measurement Five: Measurement of the Linear Propagation Loss as well as the Fibre Length Using an OTDR

## 1.6   Measurement Six: Measurement of the Linear Propagation Loss Using the Cut-Back Technic

## 1.7   Measurement Seven: Measurement of the Splicing Loss Using the Cut-Back Technique