LABORATÓRIO DE INSTRUMENTAÇÃO
E FÍSICA EXPERIMENTAL DE PARTÍCULAS
partículas e tecnologia

[Caracterization of Novel Scintillating Fibers]

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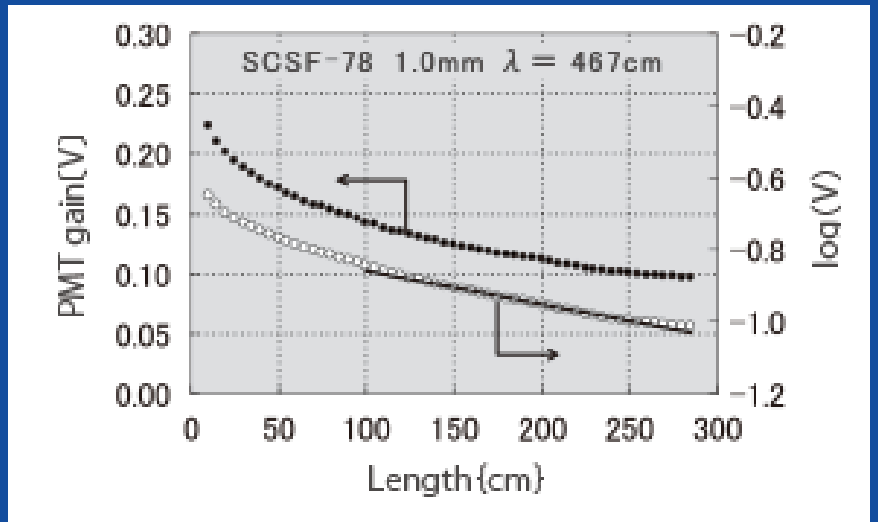
Scintillating Fibers

By using fluorescent material we can create optic fibers that capture and transmit data at the same time.

Characteristics

We are interested in studying the attenuation length of the fibers.

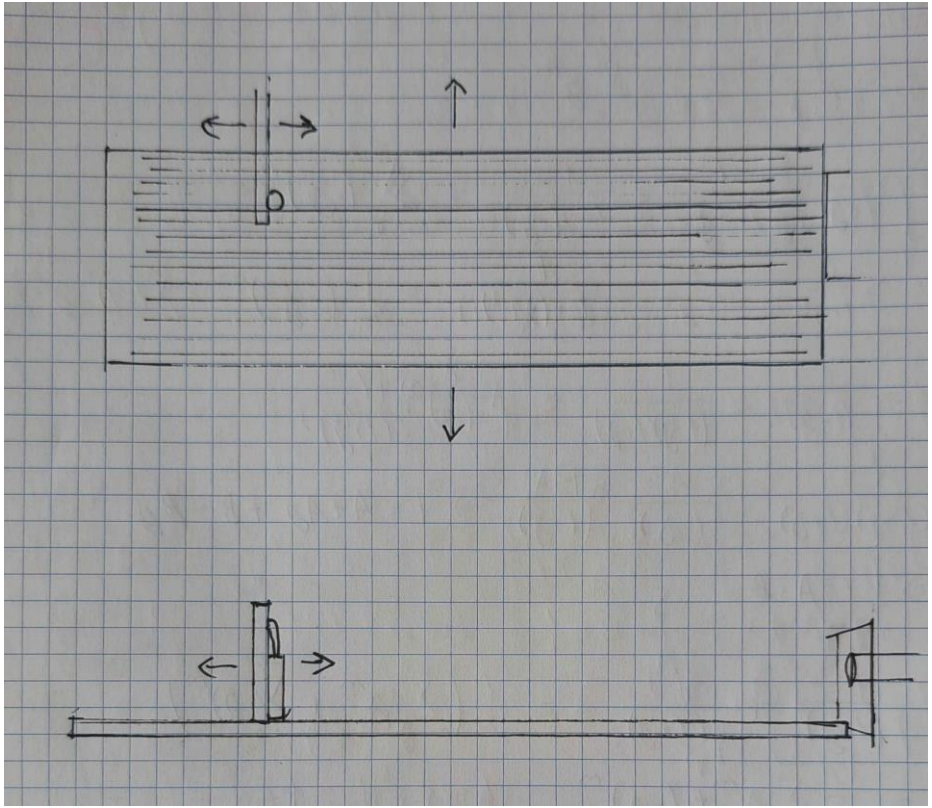
There are 3 different types we will study: SF, HF0.1 e HF0.2



Setup

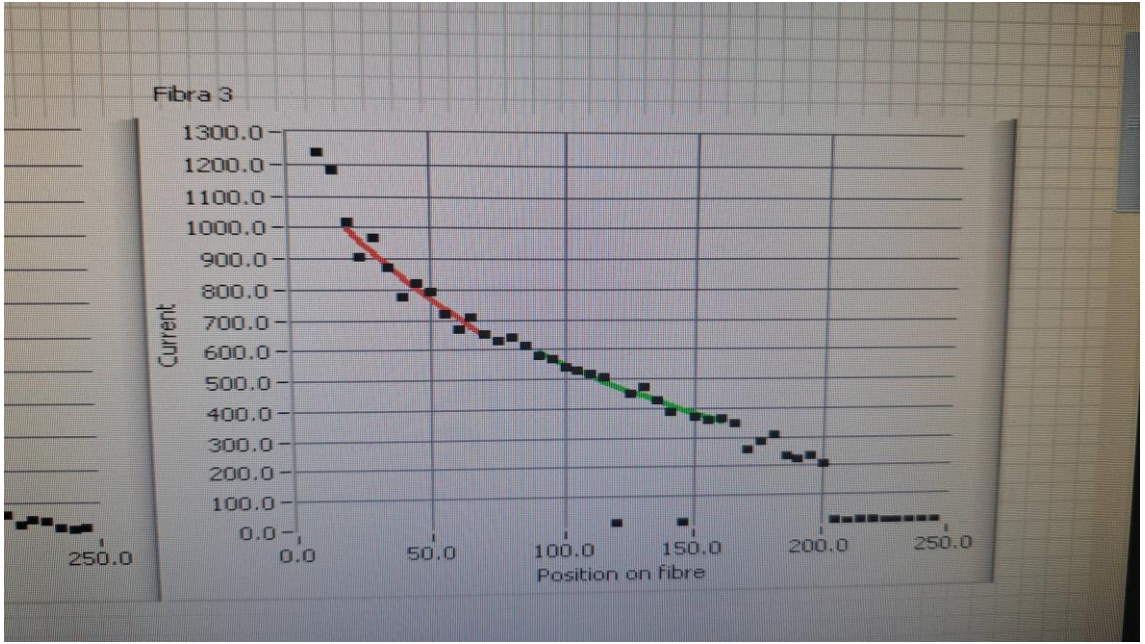
- The fibers are placed on a long tray with the tips adjusted to meet a PMT

- An LED is moved along the length of the fibers and transmits light through them

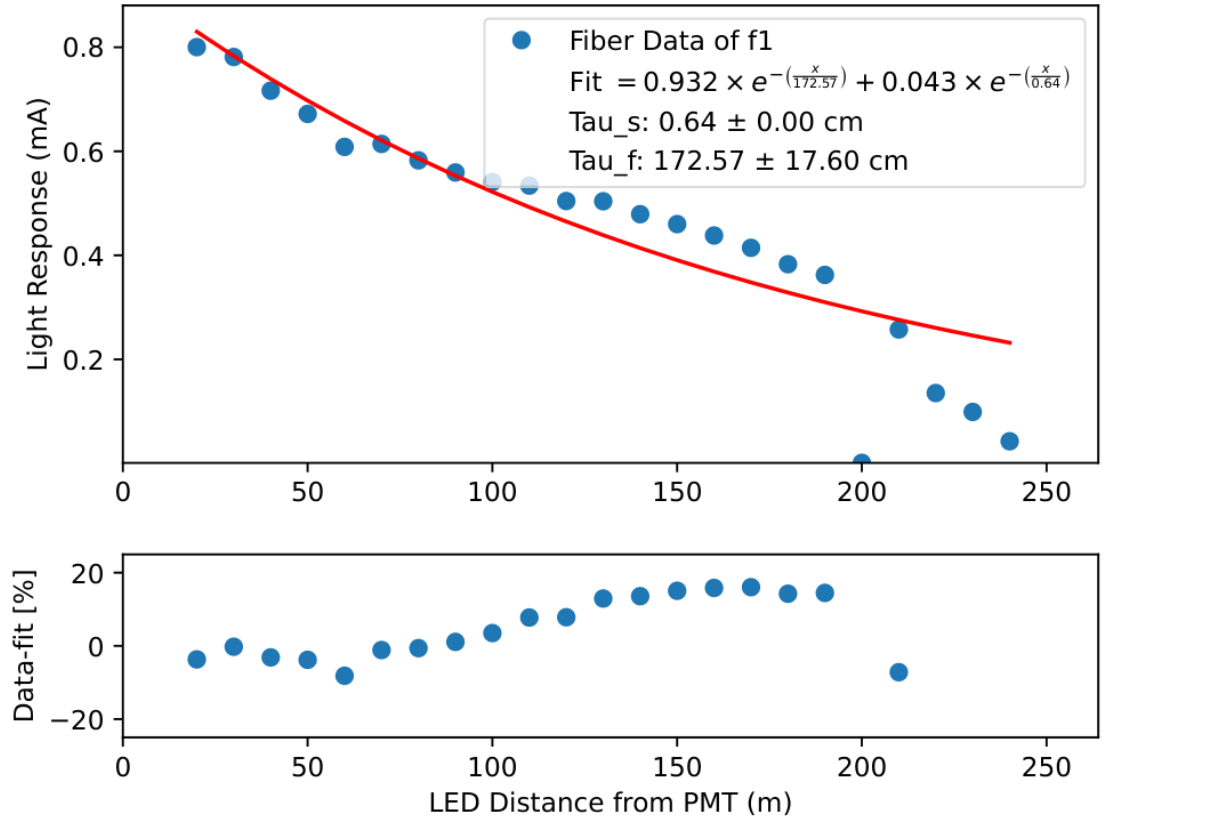


Setup

- Each fiber produces a data set between the light intensity and the distance between the LED and the PMT



Individual fiber fits



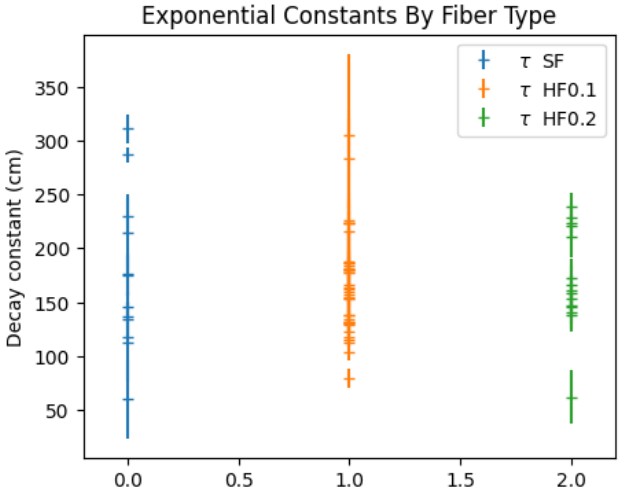
Results

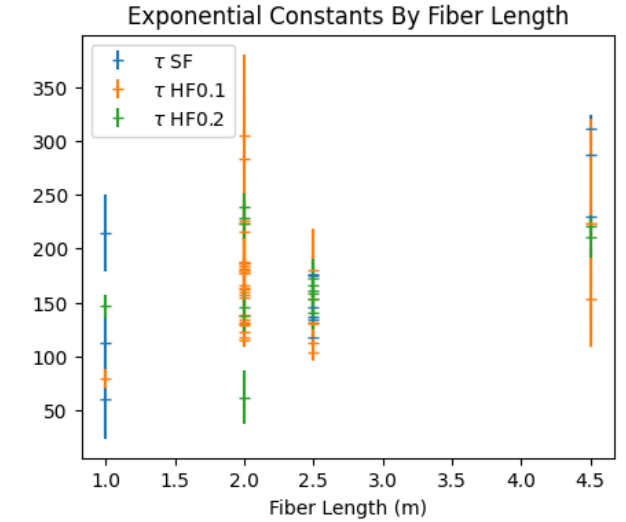
The measurements of all fibers give the following results:

- SF: 192.67 ± 41.13 (cm)
- HF0.1: 157.50 ± 12.16 (cm)
- HF0.2: 178.78 ± 19.23 (cm)

However, the data for only the long fibers (>4.5m) gives:

- SF: 275.69 ± 47.16 (cm)
- HF0.1: 200.14 ± 45.56 (cm)
- HF0.2: 220.46 ± 11.82 (cm)

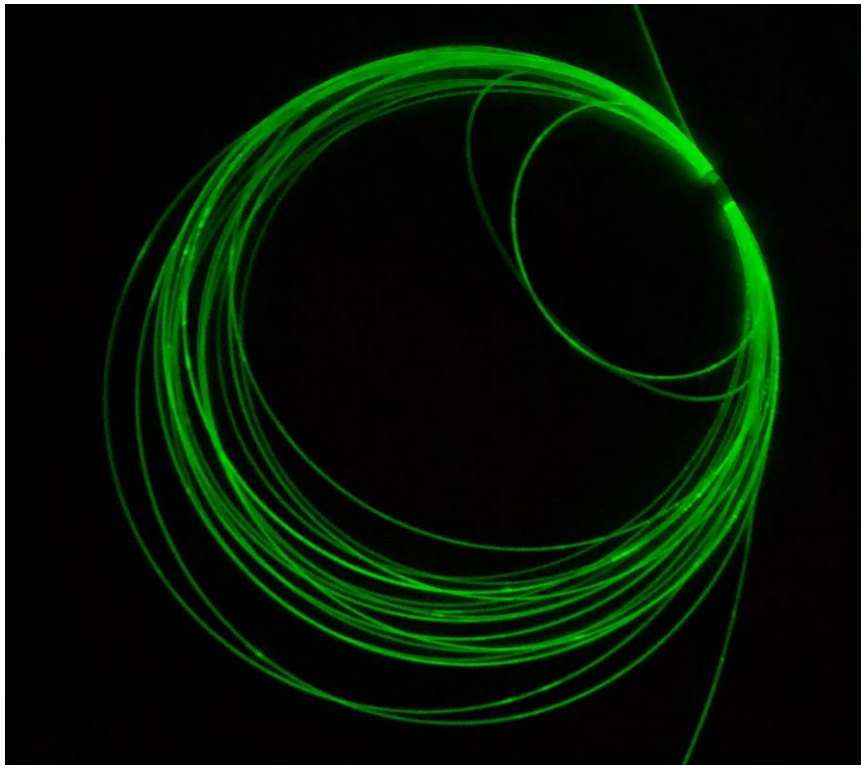




Results

Uncertainty

Many factors like the curvature of the fibers, the oscillations of the mechanical arm e possible cuts and fissures on the fibers contribute to a lack of precision and accuracy in the measurements



Questions