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Introduction (44pt)

The alignment of TuFF is done using flowing water. Changes and inconsistencies in the water can affect the TuFF fiber alignment. As a result, measurement of the flow conditions and thickness of water during the production of TuFF is needed to characterize the process.



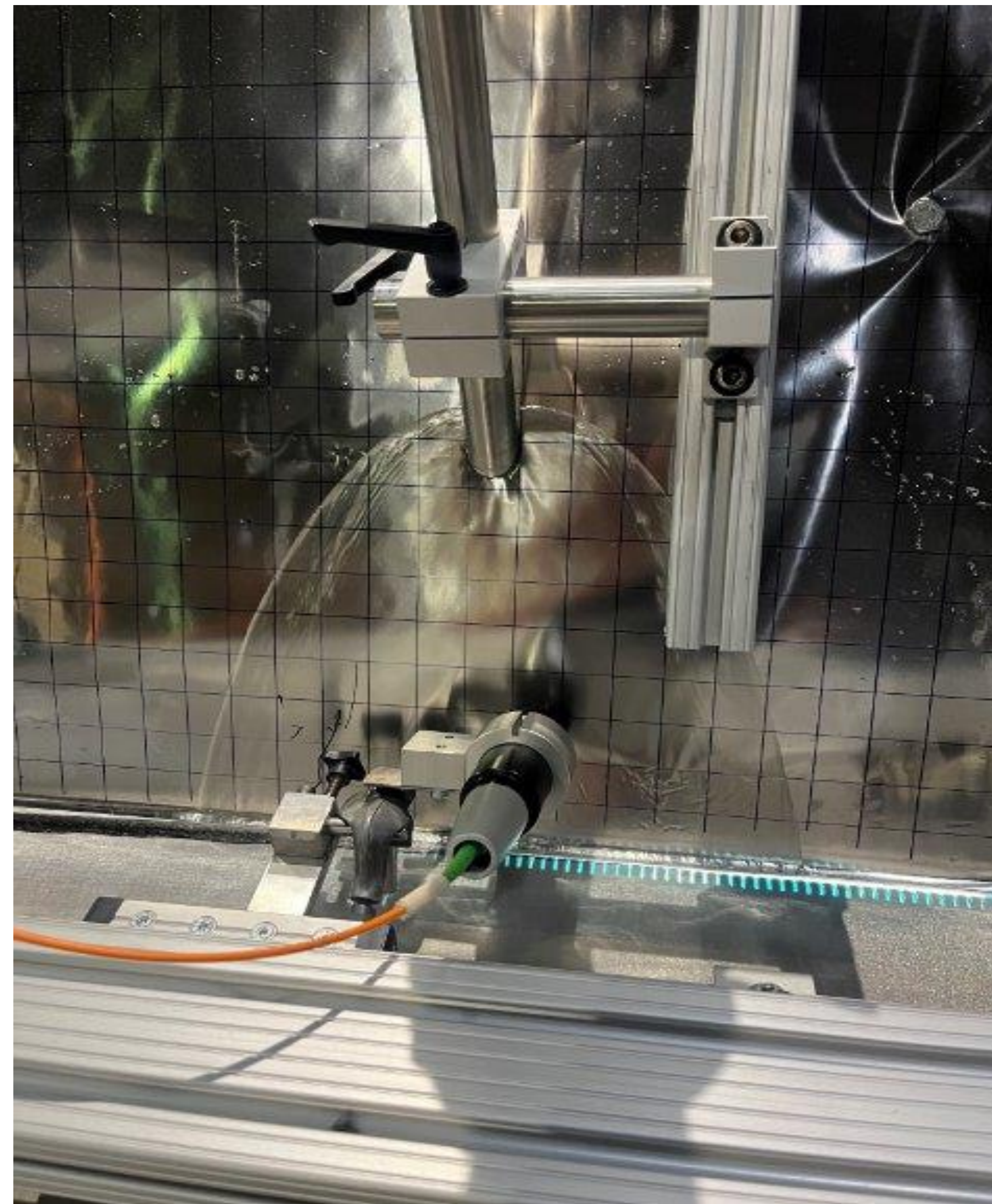
The ending solution to measure the flow thickness during TuFF production.

Objectives:

- Learn the basics of the LabVIEW programming environment
- Modify the software to accurately measure thickness of fluid over a given width
- Use software to run tests on fluid conditions during TuFF production

Problem Description

- Develop a process for measuring flow thickness during TuFF Alignment
- Develop software that can control a linear sensor that is connected to an optical sensor that travels across the width of the TuFF process and captures thickness information during processing

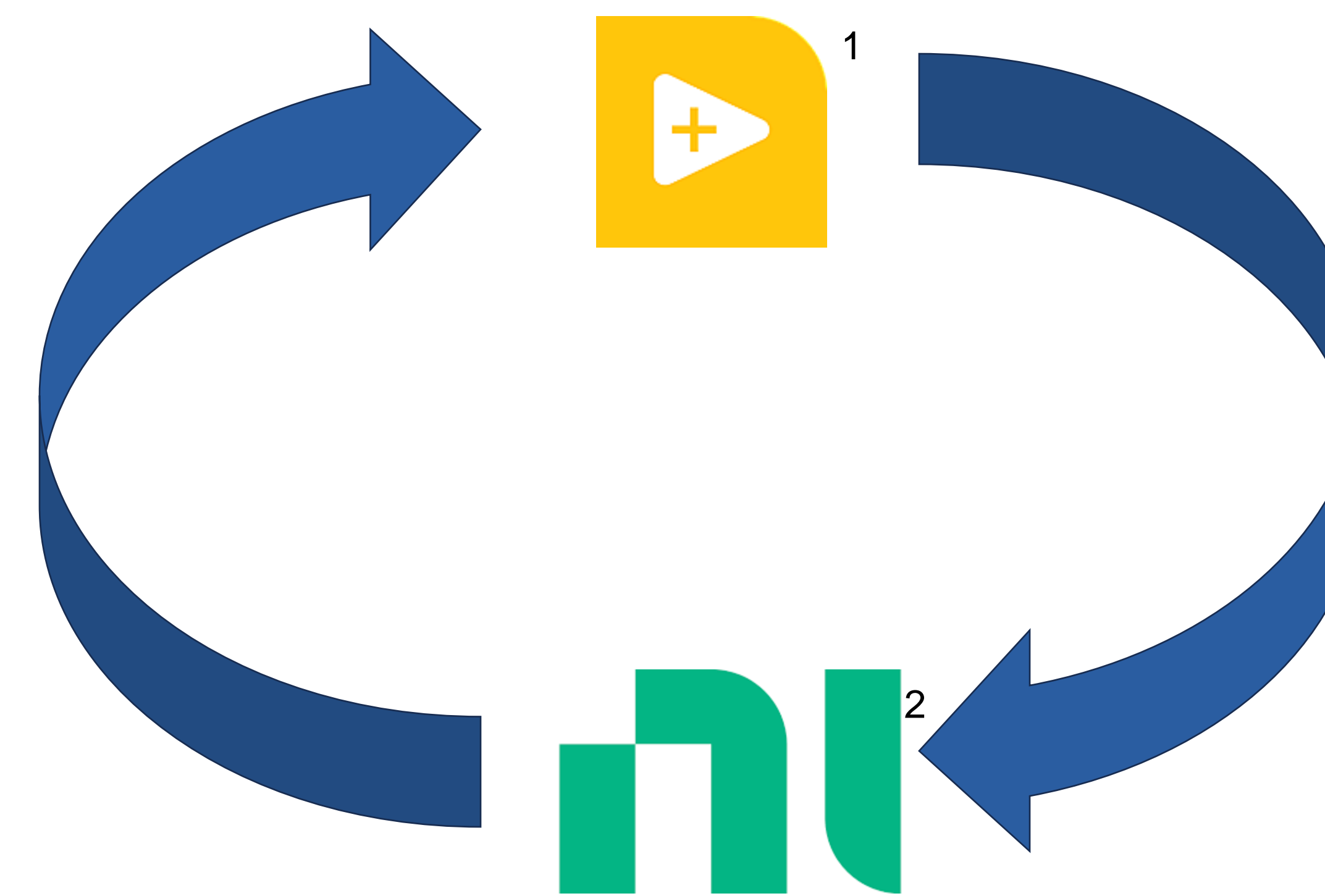


The solution for the problem (above) involved the use of a moving scanner. This scanner measured the thickness of the water film used for TuFF production.

Tasks and Approach

There were three main tasks: Learn LabVIEW, modify software and run the hardware to capture data.

The approach to learning LabVIEW was research and experimentation oriented.



The above flow chart shows the general process of learning LabVIEW. Starting with research using Ni manuals and then experimenting in LabVIEW making random or targeted programs, just to practice and apply knowledge.

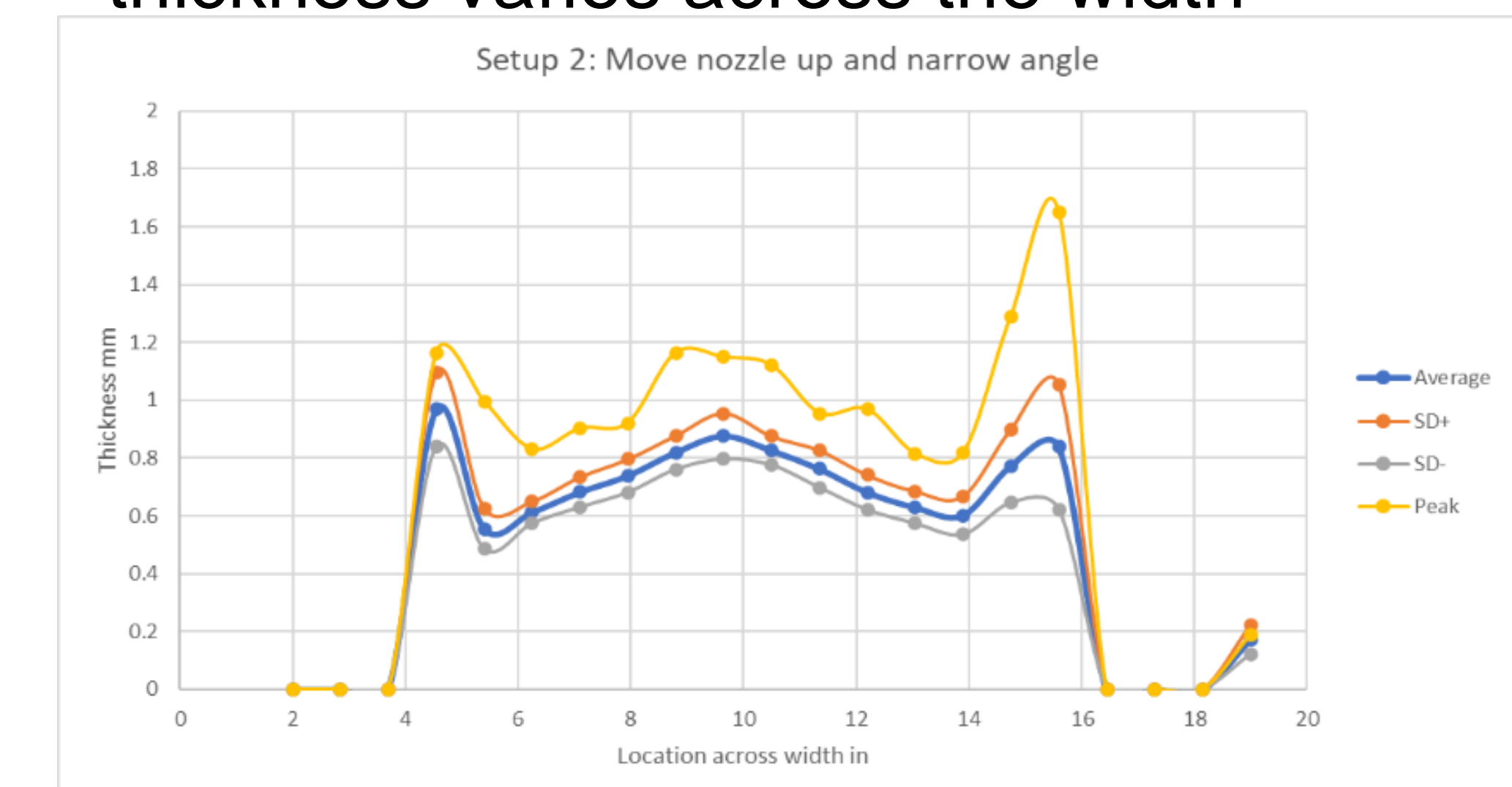


During testing it is extremely important to maintain the correct distance between the scanner and the medium it is scanning to get proper data.

1: LabVIEW logo from Ni.com
2: Ni Logo from https://commons.wikimedia.org/wiki/File:National_Instruments_logo_2020.svg

Results and Discussion

- A LabVIEW program was modified to be able to capture thickness data and a new simplified User interface was implemented including advanced and simple sections
- The updated software was able to capture the thickness information and plot the data showing how the thickness varies across the width



The final chart after a full test on running TuFF production line. The different lines are required to show more information and to account for the dynamic nature of the moving water.

Acknowledgements

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