

University of Liège  
School of Engineering and Computer Science



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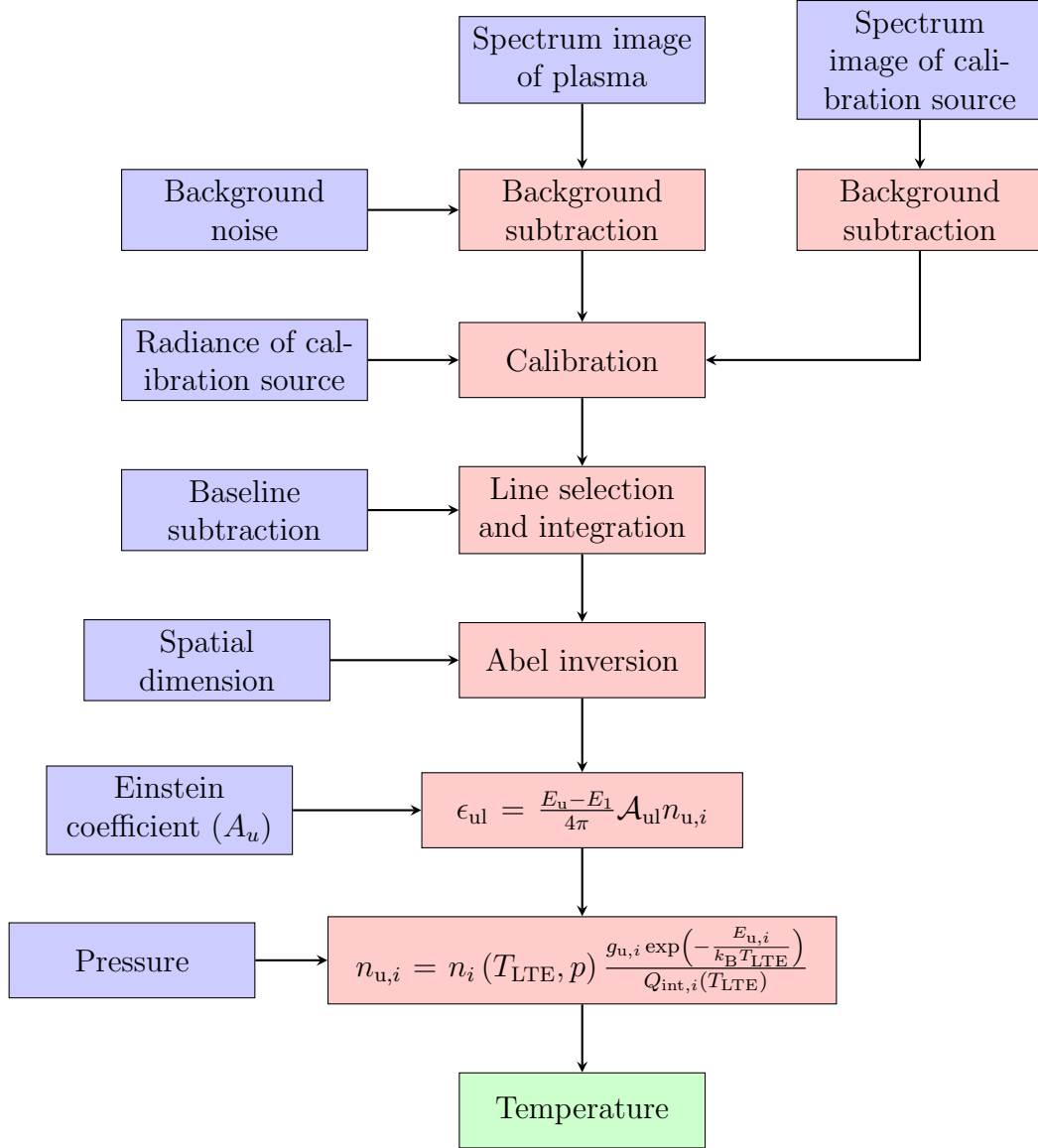
# Uncertainty quantification in the free-stream temperature measurement inside the VKI Plasmatron

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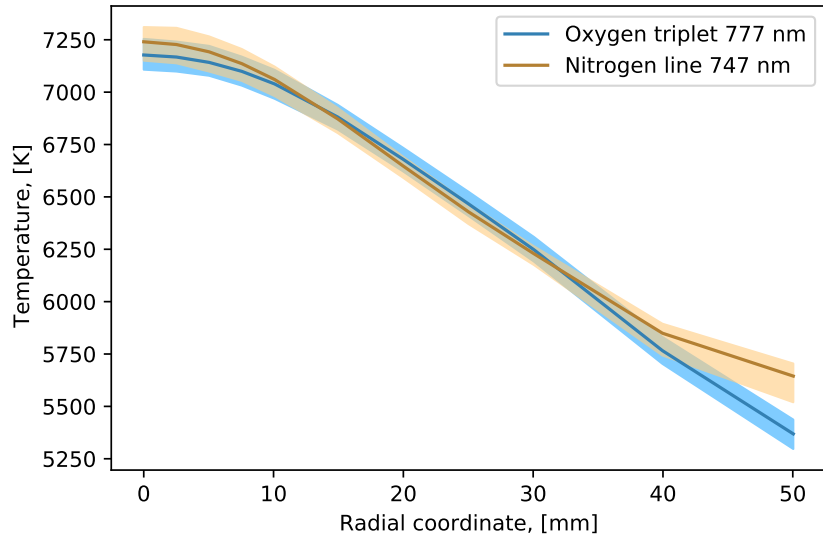
Under the supervision of Prof. **M. Arnst**, **A. Fagnani** and **J. Coheur**

Master's thesis carried out by **Thomas Chavet**  
to obtain the degree of Master of Science in **Aerospace Engineering**

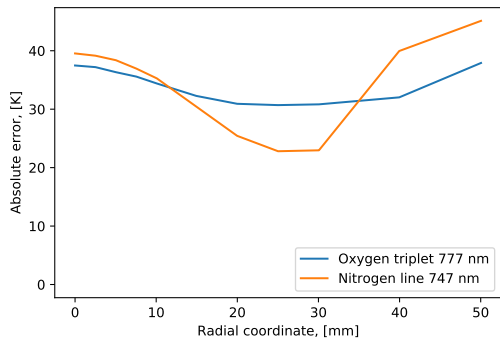
Academic year 2020-2021



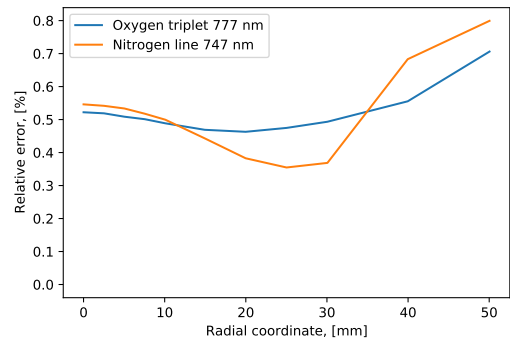
Flowchart summarizing the chain of the temperature measurement of the plasma inside the Plasmatron with the blue boxes as uncertainty inputs and the red boxes as computation boxes.



Uncertainties on the temperature accounting for the uncertainty on all parameters (the continue line is the nominal temperature).

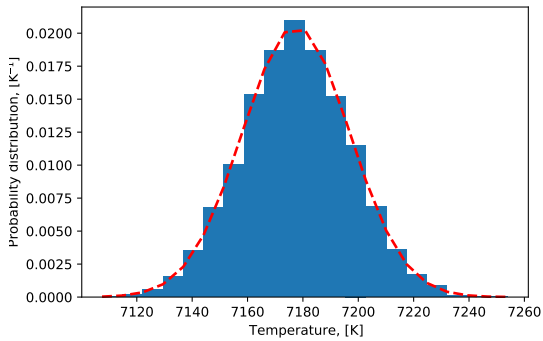


(a)

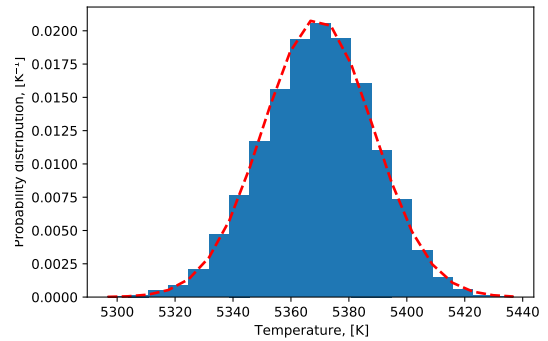


(b)

Error on the temperature measurement considering the uncertainty on all parameters.



Probability distribution function of the temperature at the center of the jet considering the uncertainties on all parameters



Probability distribution function of the temperature at 50 mm from the center considering the uncertainties on all parameters