

# 10th IYNT 2022; Tskneti, Georgia

## Problem 1. *Chocolate and speed of light*

Opponent: David Roth  
Team Romania - Limitless 3.0

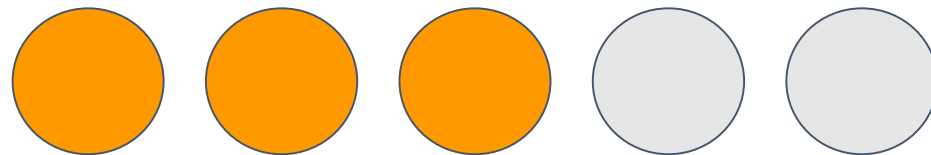
21-28 August 2022

## *Problem statement:*

A visual method to measure the **speed of light** is to place a chocolate bar in a **microwave oven** until chocolate starts to **melt** and measure the distance between **hotspots**. Study this effect and investigate the **accuracy** of the method.

# Theoretical Part

Strong points	Weak points
<ol style="list-style-type: none"><li>1. Understood the phenomenon</li><li>2. Added a chemical explanation related to <i>H2O</i> composition</li><li>3. Explained all the components and its apparatus</li><li>4. Defined anti-nodes and their correlation with standing waves</li></ol>	<ol style="list-style-type: none"><li>1. Too long introduction unrelated to the phenomenon</li><li>2. Too much text unrelated to the phenomenon</li><li>3. Did not explain the theoretical method and equations (in the theory) with which one can derive wavelength <math>c = \lambda f</math>.</li></ol>

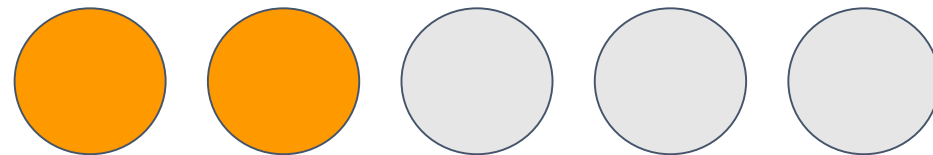


# Experimental Part

Strong points	Weak points
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1. Varied different parameters (did not explain why they matter)

1. No explanation for the parameters measured.
2. No explanation for the correlation between time  $T$  and measuring the speed of light.
3. No results were explained **how** they were derived.
4. No hypotheses
5. Measurement not accurate
6. The parameters varied were not relevant (nothing should change, frequency is the same)
7. Did not perform the experiment more times, there could have been an error in that experiment

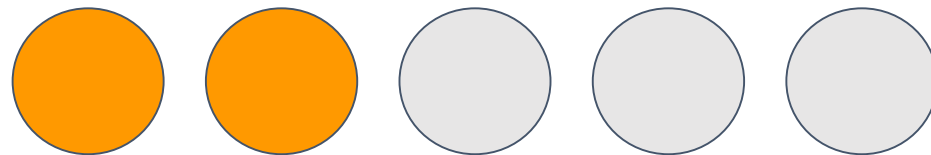


# Conclusion

Strong points	Weak points
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1. Explained clearly the methodology of the experiment

1. No explanation of the errors and different settings effects
2. Unclear correlation between theory and experiment
3. Not enough conclusions



# Discussion topics

1. Why do you think the hotspots would vary by varying the time, and also by varying the chocolate?
2. If the frequency is changed, what would happen with the results? Is it a coincidence?
3. How did you measure the hotspots in each chocolate? What was the temperature criterion? Were they visible?
4. How did you determine the hottest spots?
5. What parameters do you think will change the results?(relevant parameters)

# Discussion