A Universal Language of Science
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Abstract- A specific spoken and written language can be used to describe a physical law but to another culture with a completely different spoken and written form the information contained therein is incomprehensible. There is a method to convey certain types of scientific information by using just dimensions and once the meaning of one key dimension is determined it is possible to extract the information content of other dimensions without ever having to know the authors spoken and written language.

Introduction

It is suggested that English has become the language of science, but before that it was Latin, Greek and other languages. An article titled, "The Quest to Perfect the Universal Language of Science" suggests that a contemporary language can become a universal language of science.[1] Some will state that mathematics is the language of science, but until digital came along there has never been available a planet-wide set of symbols such as those provided by ASCII and UNICODE.

Dimensions, including angles, can supplant the word descriptions of scientific principles. There is a condition before dimensions alone can be used to transfer physical law principles. Each culture must have already identified some basic characteristics of physical law and will have developed associated mathematical processes that identify specific dimensional characteristics.

 Basic geometry uses dimensions and angles, and rules can be identified to describe specific types of relationships between the position of a dimension in a specific type of geometric form. Triangles can have SSS similarity even if the triangles have a different type of dimension. The SSS similarity can be exploited to present physical law principles. It is already known that some dimensions have specific relationships and putting these same dimensions in a geometric form allows additional information to be obtained from dimensional combinations.

A right triangle is a basic form in Euclidean geometry and it can be the basis for identifying some basic characteristics of physical law if a culture is aware of the existence of electromagnetic (EM) waves and that the dimensional descriptors, wavelength and frequency, are inversely proportional.

Right Triangle Pair

All the legs of a right triangle will have the same dimensional descriptor. It is possible to create a pair of right triangles with different dimensional descriptors such that basic algebraic operations can be performed on the pair. The reason to pair a set of right triangles, each being described by a particular type of dimension, is to obtain a resultant that is the product of the pair, the same as done using algebraic relationships. The two triangles must be linked by a common element to retain their SSS similarity, Figure 1.

The first triangle of the pair will be labeled *Wavelength* and the second triangle *Frequency*. The dimension of the legs of the *Wavelength* triangle will be given the dimension of 1. The legs of the *Frequency* triangle will be given the value of π to represent frequency in radians. To retain proportionality when the angle θ is changed, the vertical leg was chosen to be the common element. The algebraic formula $c = \lambda/f$ describes the relationship between wavelength, frequency and the speed of light, where c is the speed of light, λ represents wavelength and f frequency. A paper published in an IEEE publication titled, "A Methodology to Define Physical Constants Using Mathematical Constants" describes the development of the paired triangle concept. [2] The postulate below Figure 1 is contained in ref. (2).

√2   1   π   2π√2

θ   θ

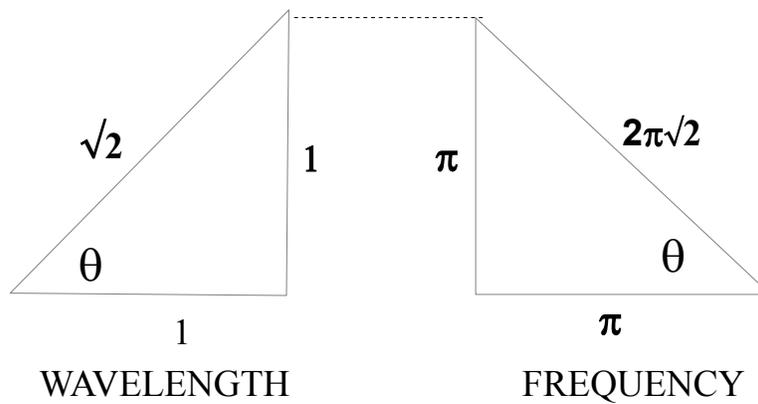1   π

WAVELENGTH   FREQUENCY

Figure 1

Figure 1 represents a linked dimensional relationship between two right triangles where the dimensions have an inverse relationship.

"The wavelength-frequency triangle pair presents a basic postulate:
When the numeric value of the leg of one triangle is multiplied by the hypotenuse of the second triangle, the resultant is the constant of proportionality between the triangles. When each of the products are equal the two triangles are inversely related."

Summary

The triangle pair replicates the known algebraic relationship between EM wavelength and frequency. It also identifies where the EM frequency and the speed-of-light (SOL) have the same numeric value.

This is a simple example of where dimensions can be used to transfer basic physical law information from one culture to another without needing to know the spoken or written language of another culture. More complicated physical law fundamentals can be presented using geometric volumes.

The SSS similarity between the wavelength and frequency triangles allows a basic set of units, *intrinsic* units of measure, to be identified without knowing their size beforehand. Mathematical physicists will be able to use the mathematically define value for the SOL in physical law formulas when they use *intrinsic* units in their mathematical formulas.

References

[1] Chen, S. "The Quest to Perfect the Universal Language of Science" Wired 08.30.17
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[2] Makinson, F. H., "Methodology to Define Physical Constants Using Mathematical Constants",
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