On electrodynamics

Translated by D. H. Delphenich

After one and a half centuries, we still know little more than nothing about the geometria situs, whose existence LEIBNITZ suspected, and only a pair of geometers (EULER and VANDERMONDE) granted a brief glance at.

A main problem at the interface between geometria situs and geometria magnitudinis is that of counting the number of times two closed or infinite lines link each other.

Let the coordinates of an undetermined point of the first line be \(x, y, z\), while those on the second one are \(x', y', z'\). Let:

\[
\iint \frac{(x' - x)(dy' dz' - dz' dy') + (y' - y)(dz' dx' - dx' dz') + (z' - z)(dx' dy' - dy' dx')}{[(x' - x)^2 + (y' - y)^2 + (z' - z)^2]^{3/2}} = V.
\]

When that integral is extended over both lines, it will equal

\[4\pi m,\]

and \(m\) will be the linking number.

The value is reciprocal, i.e., it will remain the same when both lines are switched with each other.

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