

## On Applied Physical Geometry

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Abstract: A spherical phenomenon for the origin of a new field of applied physical geometry was found.

PACS: 02.40.Dr, 02.40.Yy, 02.10 -V, 02.40.Ky

MSC : 51 M04

Keywords: Euclid, fifth postulate, spherical geometry, physical applications.

NA', NB', NC' are the segments of a sphere S whose north pole is N. Choose a point A on NA'.

With center N, radius NA, describe an arc cutting AB' at B and AC' at C.

So,  $NA = NB = NC$  ----- (1)

Take a point F on NA. With center N, radius NF draw an arc meeting NB at E and NC at D.

So,  $NF = NE = ND$  ----- (2)

From (1) in triangle NAC, angle NAB = angle NCB (3)

And in triangle, NBC, angle NBC = angle NCB (4)

From (3) and (4) we obtain that angles  $NAB = NBC = NCB = 90$  degree (5)

Similarly from (2) we can show that angles,  $NFE = NEF = NED = NDE = 90$  degree (6)

From (5) and (6) we get that the sum of the interior angles of spherical quadrilateral BCD

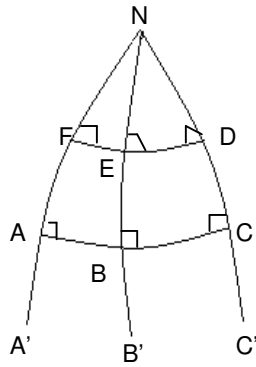
BCDE is equal to 360 degrees ----- (7)

## Discussion

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Eqn. (7) establishes the fifth Euclidean postulate [1] and 2)] which do NOT hold in sphere. But our geometrical construction and proof are consistent. Further studies will give birth to a new field of applied physical geometry which is going to be useful in physics

The authors welcome comments



## References:

[ 1 ] Smilge: In the search for beauty, (Mir publishers, Moscow,1972) pp.1-50

[ 2 ] Effimov: Higher Geometry, ( Mir publishers,Moscow, 1972 ) pp.1-30