AP THEORY AS A MULTIVERSAL INTRINSIC
GRAVITATIONAL FLUX THEORY

H. E. WINKELNKEMPER

Abstract. We show that in AP Theory the concept of a flux has a more nat-
ural definition and a more natural purpose, than the fluxes appearing in classi-
cal string theory, which are related to its so-called Compactification Problem.
Thus the closed, smooth, simply-connected manifolds appearing in AP Theory
should have a different function physically (than Calabi-Yau manifolds repre-
senting extra hidden dimensions) since AP Theory is characteristic of (3+1)-D
and does not need higher dimensions to be mathematically consistent.

1. Introduction

In this note we interpret the basic fundamental theorem of AP Theory, namely
González-Acúña’s theorem, (see p. 2 of [W]), as giving a ‘gravitational flux’, roughly
in the form of Weyl, see Remark 1 below. This seems more basic and natural, at
least qualitatively, than using, e.g., postulated differential p-forms, inspired by
Maxwell’s equations, which generalize the concept of an EM field.

In AP Theory, the \( h(r) : \Omega_n \rightarrow \Omega_n \) represent, via the generation of the \( W^4(r),([W],
p.2) \) gravitational fluxes.

This leads us to consider the classical string theory so-called ‘Compactification
Problem’, [DDK], [Gr], of interpreting the 6 ‘hidden extra dimensions’ appearing
because string theory lost its way from 10 \( D \) to 4 \( D \), so to speak. One searches for
a ‘geometry’ ‘spanning’ these 6 hidden dimensions, so to leave the 4 dimensions of
spacetime as the only macroscopic dimensions.

Of course, since AP Theory is characteristic of (3 + 1)-D, it has no Compactifi-
cation Problem, nor a related ‘moduli problem’, in the sense of [G], p.15, [DDK],
pp.3,4. But its closed (3 + 1)-D manifolds, \( W^4(r) \), with \( \pi(r) = 1,([W], p.2) \), nev-
ertheless, have some very important physical properties shared by classical string
theory’s Calabi-Yau manifolds, used to ‘span’ the geometry of the extra dimensions,
in an attempt to ‘solve’ the Compactification Problem.

In AP Theory, the notion of flux is also driven by the huge membranic, magnetic
part generated by the membranic \( h(r) : \Omega_n \rightarrow \Omega_n \). Compare to [DDK], p.5.

The Ricci flatness of Calabi-Yau manifolds is considered to be a very important
property for solving the compactification problem, for relativistic reasons, see [G],
p.10, and we arrive at the fundamental question of this note: What does it re-
ally mean that Calabi-Yau properties, (Flatness and Fluxness), are still present in
AP Theory, with the closed \( W^4(r) \), with their non-infinitesimal, but still smooth,
flatness? Does this non-local AP flatness suggest that the closed \( W^4(r) \) are the
quantum analogs of Calabi-Yau surfaces, which consist only of Kummer surfaces,
(which are all well represented in AP Theory? See [CW] and Remark 3 below).
2. Remarks, Questions, Quotes

1. "But mass is a gravitational effect: it is the flux of the gravitational field through a surface enclosing the particle in the sense that charge is the flux of the electric field. In a satisfactory theory it must therefore be as impossible to introduce a non-vanishing mass without the gravitational field as it is to introduce charge without electromagnetic field."

2. What does the AP 'decompactification' provided by the sheer metamathematical existence of AP Theory mean for classical String/M-Theory? It seems that AP Theory has 'frozen' branes and fluxes into a quantum non-infinitesimal (i.e., non-local) but still smooth (3 + 1)-D topology, namely AP Theory, instead of a 'mysterious quantum geometry'. Compare to [G], pp.11,15.

3. What is the deeper meaning that the $W^4(r)$, with $\pi(r) = 1$ and their non-infinitesimal, but still smooth flatness, and the Calabi-Yau surfaces, with their infinitesimal Ricci flatness, only have the Kummer surfaces in common?

4. AP Theory's closed, smooth simply-connected $W^4(r)$, with $\pi(r) = 1$, [W], p.2, contain all simply-connected, complex elliptic $E(n)$ surfaces, see [CW], in particular, $E(2)$, the Kummer surface. In fact, it is an open problem whether they also contain all closed, smooth, simply-connected 2-handlebodies, compare to [GS], p.124, p.344, Remark 9.1.17.

References


Department of Mathematics
University of Maryland
College Park, Maryland 20742

E-mail address: hew@math.umd.edu