

## ABSTRACT

Previous work has shown that there is a consistent pattern that seems to be underlying the various known solar activity cycles, which is fundamentally based on the nuclear magnetic resonance frequencies (NMR) of some of the main isotopic constituents within the solar core, hydrogen-1  $F(1H)nmr$  and helium-3  $F(3He)nmr$  and resulting in a so-called "beat-frequency", thereby suggesting that this mechanism may involve the entire Sun. Furthermore, it was found that the energy generating region of the Sun may be governed by an optimum condition where  $F(3He)nmr = 1/2F(1H)nmr$  associated with an internal magnetic field of 7 Gauss, where the beat-frequency  $F_{beat}$  represents a fundamental harmonic of the Schwabe periodicity. Using the Schwabe cycle as the basic cycle length ( $C2$ ), the astronomical and geophysical data (solar activity cycles  $C1$ ) are well represented by a fundamental harmonic progression of the form  $C1 = C2 \times 2^n$ . We will show that this harmonic progression is a superposition of two states with charges 0, 1; hence forming the  $SU(2)$  group. Therefore there must exist in the Sun a region where the ionized H and the non-ionized  $3He$  coexist. The high binding energy of  $3He$  in the relativistic limit requires the 2D state together with the presents of the Chern-Simon field (2D vector potential) which is exactly available in the Sun.

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**[Ref: Solar Activity Cycles: Indication of the Existence of Fundamental Symmetry?]**

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**Date**

19 July 2010 (Mon)

**Time**

7.00 – 9.00 pm

**Venue**

Room BC304  
The Hong Kong Polytechnic University



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DEPARTMENT OF  
BUILDING SERVICES ENGINEERING



[ C P D L E C T U R E ]

**Solar Activity Cycles:  
Indication of the  
Existence of  
Fundamental Symmetry?**

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