



MECO38
38th Conference of the Middle European Cooperation in Statistical Physics
25 - 27 March 2013, ICTP, Trieste, Italy

TOPOLOGICAL TRANSITION IN SECONDARY STRUCTURE OF RNA-LIKE POLYMER

O. VALBA

Universite' Paris Sud-11, LPTMS, Orsay, France

Abstract:

In my talk I will show that the secondary structures of random heteropolymers undergo a topological transition. Namely, for c less than the critical value the fraction of "active" nucleotides (which form the base pairs) tends to 1 as the length of the chain goes to infinity, signaling the formation of a virtually "perfect" secondary structure without gaps. In turn, for $c > c_{cr}$ always a non-perfect structure with gaps is formed. It was proved mathematically that $2 < c_{cr} < 3$; our current research deals with determination a value of transition point; it directly connects with developing new methods to generate random sequences with "effectively" non integer alphabet. Our previous results have shown that transition point is very close to alphabet used by Nature in real RNAs. Such a critical behavior can point to some statistical exclusivity of natural alphabet.