ABSTRACT

A remarkable feature of AdS/CFT correspondence is the underlying integrability structure on both sides of the duality which provides an important tool for finding both gauge theory and string theory spectrum. Though solving for the exact spectrum is highly non-trivial, semiclassical approximation in limit of large global charge is quite helpful for mapping the string states with the conformal dimensions of certain gauge invariant operators. In order to extend our understanding of integrability beyond the original $AdS_5 \times S^5$, we study different classical string solutions in a integrable deformed background of AdS.

In this context, first we study pulsating string in different subspaces such as $R \times S^2$ and AdS_3 of $\varkappa$-deformed background. We generalize the results of pulsating string to one angular momentum case. We have examined the situation when string is simultaneously spinning and pulsating in the deformed background. We also have studied different rigidly rotating strings like giant magnon, spiky string and folded spinning string and investigate the finite size effect to scaling relations between the conserved charges of such string solutions. We also study classical string dynamics and phase-space trajectories in a one parameter deformed $AdS_5 \times T^{1,1}$ background where we use numerical techniques such as Poincaré section and Lyapunov exponent to examine the chaotic behavior of the string.

Keywords: AdS/CFT correspondence, bosonic strings, semiclassical techniques, chaos