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## **Solution of the Extended Trigonometric Scarf potential and its application in hadron Physics**

*Wednesday 7 September 2022 19:10 (20 minutes)*

The approximate solution of the Schrodinger equation in D-Dimensions for Extended Trigonometric Scarf potential was investigated using the Nikiforove-Uvarov (N-U) method. The method used to solve the Schrodinger equation for a charged particle at a center and noncentral potential have been developed using the Asymptotic Iteration Method, Dirac equation, and Klein-Gordon equation. This method was based on solving the second-order linear differential equation by reducing it to a generalized equation hypergeometric type by a suitable variable change.

The extended Trigonometric Scarf potential written as

$$\begin{equation}$$

$$V(r)=\frac{a\sin^2 \alpha r + b\cos^2 \alpha r + c\cos \alpha r + d}{\sin^2 \alpha r}$$

$$\end{equation}$$

Using Extended Trigonometric Scarf potential new analytical exact energy eigenvalue and eigenfunction were obtained in fractional form using the N-U approach. We have used a heavy-light tetraquark system to verify the method's applicability and we have recalculated their mass spectra and fractional radial wave. The mass spectra obtained have been compared to experimental data and also found to improve in another comparison with other studies apart from that we also calculate heavy-heavy and heavy-light flavored meson mass spectra. We conclude that fractional models play a good role in hadron physics.

### **Is this abstract from experiment?**

No

### **Name of experiment and experimental site**

N/A

### **Is the speaker for that presentation defined?**

Yes

### **Details**

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### **Internet talk**

Maybe

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