



Contribution ID: 228

Type: **Talk**

## **Cosmology and cosmic rays propagation in the relativity with a preferred frame**

*Thursday 26 August 2021 09:00 (30 minutes)*

Cosmological models and the processes accompanying the cosmic rays propagation on cosmological scales are considered on the basis of particle dynamics, electrodynamics and general relativity (GR) developed from the basic concepts of the 'relativity with a preferred frame'. The 'relativity with a preferred frame', designed to reconcile the relativity principle with the existence of the cosmological preferred frame, incorporates the preferred frame at the fundamental level of special relativity (SR) while retaining the fundamental space-time symmetry which, in the standard SR, manifests itself as Lorentz invariance. The cosmological models based on the modified GR of the 'relativity with a preferred frame' allow to explain the SNIa observational data without introducing the dark energy and also fit other observational data, in particular, the BAO data. Applying the theory to the photo pion-production and pair-production processes, accompanying the propagation of the Ultra High Energy Cosmic Rays (UHECR) and gamma rays through the universal diffuse background radiation, shows that the modified particle dynamics, electrodynamics and GR lead to measurable signatures in the observed cosmic rays spectra which can provide an interpretation of some puzzling features found in the observational data. Other possible observational consequences of the theory, such as the birefringence of light propagating in vacuo and dispersion, are discussed.

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

No

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

N/A

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

Yes

### **Details**

N/A

### **Internet talk**

Yes

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**Session Classification:** D Cosmology, Astrophysics, Gravity, Mathematical Physics