

Effect of Kinetic Technique and Specification of Wave-Particle Interaction on Plasma

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Abstract - Specification of kinetic is an initial fact for plasma and plasma fields in the system of space. The kinetic and dynamic moment of species such it is modified in wave and particle in the material and space. In physical science, plasma may change characteristics all around the region where it has been populated and changed position, velocity, temperature, number density, stability and instability, frequency, relativistic and non-relativistic momentum property and during all type of activity, science, and technological program and challenge for advance field and it is mostly specified. The different manifestations of plasma are responsible for all types of controlling activity in which frequency, energy, and wave may be rarified and densified in the environment or material space. The review of this paper is mainly focused on the application of plasma and plasma fields in the physical science and technological world. We examine and observe the new way of methodology and research. Day by day we have improved its area and mindset. So the new physical program research and innovation has been specified to a new way of the physical science world.

Index Terms - Plasma, Kinetic interpretation, Role of temperature.

INTRODUCTION

In general plasma is coin of two specific character, ions and electron as well as neutral. The source of plasma has been specified in form of ionized gas and pattern species may change during operational field. However, the sequence of fashion of free energy as been terminated in any area and field of innovation and research.

The free energy is common property of quantity and in the whole system and space has been modified the configuration of micro and macro plasma particle and wave where it is specified regular and irregular order. Plasma can also be examined as (P-phase, L-loss, A-ascertain, S-species, M-motional, A-amplitude) i.e plasma –phase loss of ascertain species of motional amplitude. Kinetic concept of plasma field is

basically to change model and fashion of all species of material space. It is mostly well-known fact that where interaction is applicable to specified positional configuration in shape and size, velocity, density, number density as well as temperature, frequency, wave and wave field has been growth and decay and ascertain for application of area increase day by day. Recently interaction of pattern species which appears in different form where energy may stable and unstable i.e rarified and densified. So, day-by-day plasma is perturbed and can be changed fluctuation in magnetized and unmagnetized state of matter and space. The variety of activity sequence has been changed during observation, prediction, explanation and measurement.

The aim of this paper is mainly focused on the understanding of internal and external interpretation of material quantity and energy particle as well as wave program. So the new way of technique, methodology, research and innovation has been applied and its area of application is vital and very skillful for society, science and technology and scientific world.

KINETIC INTERPRETATION

In this paper, we have focused on kinetic behaviour of particle species present in free environment and material system and can change fundamentally where free particles model of species which has been transited single and multiple stage characteristics. The position and velocity both will change pattern due to magnetic and electric pressure and again positions deviation and velocity distribution function may rise or fall i.e it has been number density of particle and wave modified. We observed that particle possess similar and dissimilar free activity. But, all particle wave are oscillating simultaneously without any external cause applied in plasmatic system and environment where it has been specified internal

pressure which tiny bits character is perturbed. However, species are typically specified by particle with the same charge and mass. Initially, we have examined that species pattern in the free environment in which it is concerned with oscillating properties and is damped or grown where energy is profiled positional configuration of species exchange and transferred momentum, energy and centre of mass.

In this process, kinetic behaviour of species has the state of position and velocity during interaction of elementary particle. Initially, Landau in 1936, observed and examined that kinetic state of species which has processed been a variety of specification of wave characteristics and particle exchange model in the material universe and free environment. We have specified that elementary pattern of species may change with effect of magnetic and electric field vector. In this interval, the internal energy as well as free energy in the system will change with respect to relative motion in between them. Landau suggested that damping is processed by which wave can either damp or grow in a plasma. Again, Landau damping is fundamental process of kinetic specification of particle and wave may damp or grow simultaneously. All type of fluctuation has been evolved during interaction. Free energy space in which ions and electron both will change the order of property, activity and pattern because time sequence are mostly specified by positional shift, velocity distribution function as well as particle velocity distribution function with frequency distribution are mostly populated where number density of species are modified. Again, Heissenberg uncertainty principle is applicable for matter wave in which the behaviour of wave particle can exchange surrounding area of environmental space. Since, momentum position, energy, time character and energy density has been specified and exchanged in material space.

The fluctuation and scattering maintain all types of damp and growth during stable and unstable plasma (instability plasma). When all the perturbations are damp in the Coulomb interaction of individual particles, it tends towards the stability of the plasma. However, all fluctuations are not always stable, but the presence of free energy can cause perturbations to grow. Now, merging fluctuation is called in-stability means unstable plasma. In this case, we have observed that plasma instability, amplitude becomes very large. The scattering particle can control by the interaction of

the particle with the collective wave. Such wave motion of collective wave pattern will have individual coulomb particle interaction. Plasma instability and amplitude can be by magnetic pressure, where positions and velocities are defined parallelly and perpendicularly and also generate all types of activities of the earth magnetosphere, magnetic region, magnetopause, and whistler-mode wave. Firstly, Vlasov theory and equation have been most applicable to observe and examine kinetic behavior and fluctuation of energy spectrum pattern in which quasi-linear saturation arises. In this case, plasma is stable where damping rate $|\omega_i| \ll |\omega_r|$, this mean the perturbation is in the normal mode of plasma and damping takes place quickly. Again, if $|\omega_i| > 0$, then waves grow where a large amplitude is evolving. Now, plasma instability is divided into :-(1) microscopic instability (kinetic) and (2) macroscopic instability (configurational). Again, Macroscopic instability is considered configurational space. Microscopic instability- position and velocity where it depends upon the actual shape of the distribution of function. Finally, the kinetic interpretation of plasma in the material system and environment are the two most important aspects. Vlasov equation is applicable for the kinetic state of plasma species, which also appears as collisional and collisionless behavior of wave-particle interaction and pattern where number density, charge density, energy configuration can be changed in the presence of electric and magnetic field vector which effect velocity and acceleration surrounding its region.

ROLE OF TEMPERATURE

Basically, temperature is one of the most important character in material and environmental space. We have think and study that temperature which has been aligned with energy pattern and programmed and is proceeding to derivative of time sequence and can be modified during activity and progress of any type of mobile and immobile, atomic and nuclear reaction transition state of gas where bound state of atom either damp or grow.

Temperature is common concept of free environment and is concerned with energy and can be measured in Kelvin or electron-volt. It is known to all, free energy is anywhere may be populated and is perturbed. When temperature as well as energy rarified and densified

where the solid state of material is composed atom, molecules, ions. However, free space is full of oscillation in which optical spectrum pattern of energy generally unperturbed due to species may be characterized by wave function and is concerned with modification of wave particle interaction program in which gaseous state of species are mostly ascertain of enhance hierarchy of energy sequence. At very high temperature ionization of gas are mostly sustained. Again, it is defining feature of plasma. In general, the degree of plasma ionization is examined and observed by electron temperature relative to ionization energy i.e more weakly by density.

Initially, Saha equation who had shown relationship between them. At low temperature ion and electron tends to recombine into bound state and eventually plasma will become a gas. Moreover, the behaviour of electron will tend close to thermal equilibrium where their temperature is relatively specified. The characteristics of temperature which is signified the derivation of Maxwellian energy distribution function and is applicable for all type radiation specification where it is large difference in mass. Again, the electron proceed toward thermodynamic equilibrium amongst themselves and much faster than they come into equilibrium with ions or neutral atom. On the basis of observation mostly far difference between ions-temperature and electron-temperature. Again plasma -temperature or temperature can generally be classified into thermal and non-thermal usually it is known as hot plasma and cold plasma.

CONCLUSION

The view of paper is mainly focused on the area of plasma in which it is specified in plasma kinetic and role of temperature. In material space kinetic and temperature both are very well-suited aspects for observation, measurement and prediction of microscopic and macroscopic plasma stability and instability. Kinetic is generally signified as position and velocity change in material system and free environmental space where which have possessed a lot of variety of activity of species. When radiation falls on free species and is perturbed in fluctuation and scattering and can change the entire characteristics of energy program. Again, it appears and proceed order of interaction in collisional and collisional less character. Again, temperature as well as energy is

most eminent character of free state and system and is applicable to change number density of electron and ions due to which plasma species are characterized. So many state of application of phase space, particle and wave as well as matter wave. When temperature rise or fall on the system of plasma state and effect of temperature in the material space in which technological program as well research and innovation day by day to proceed.

This review of paper of the facts that plasma is one of the fruitful concept to applicable and improved the research in all field. Now these days without application of plasma we cannot think about innovation, research and specification in any field.

REFERENCES

- [1] L.Landau, "the transport equation in the case of coulomb interaction"= Physik Z.Sowjet union 10, 154(1936).
- [2] L.Landau, " On the vibration of the electronic plasma". J.Phys.USSR 10, 25(1946).
- [3] A.Rogister and C.Oberman, " On the kinectic theory of stable and weakly unstable plasma. Part 1- J.Plasma physics 2, 33(1968).
- [4] I.Langmuit, "Scattering of electron in ionized gas", Phys, Rev 26, 585(1925).
- [5] S.D Baalurd, J.D.Callen and C.C Hegn, " Instability-enhanced collisional effect and Langmuir's paradox" phys.Rev Lett 102, 245005(2009).
- [6] K-U Riemann, "Kinectic analysis of the collisional plasma sheath transition" J.Phy.D.Appl.Phys 36, 2811(2003).