List Of Publications

Refereed Journals:

1. **Elliptic Flow of Thermal Dileptons as a Probe of QCD Matter.**
   Preprint : Nucl-th/1111.2159

2. **Evolution of Collectivity as a Signal of Quark Gluon Plasma Formation in Heavy Ion Collisions.**
   Payal Mohanty, Jan-e Alam, Bedangadas Mohanty.

3. **Characterizing the Partonic Phase by Dilepton Interferometry.**
   Payal Mohanty, Jan-e Alam, Bedangadas Mohanty.

4. **Radial Flow from Electromagnetic Probes and Signal of Quark Gluon Plasma.**
   Payal Mohanty, Jajati K Nayak, Jan-e Alam, Satosh K Das.
   Preprint : Nucl-th/0910.4856

5. **Nuclear Suppression at Low energy Heavy Ion Collision.**
   Santosh K das, Jan-e Alam, Payal Mohanty, Bikash Sinha.
   Preprint : Nucl-th/0910.4853
6. **Dragging Heavy Quarks in Quark Gluon Plasma at the Large Hadron Collider.**

   Santosh K das, Jan-e Alam, Payal Mohanty.


   Preprint : Nucl-th/1003-5508

7. **Probing Quark Guon Plasma Properties by Heavy Flavors.**

   Santosh K das, Jan-e Alam, Payal Mohanty.


   Preprint : Nucl-th/0908.4194

**Axiv Submission:**

1. **Thermal Radiation from an Expanding Viscous Medium.**

   Sukanya Mitra, Payal Mohanty, Sourav Sarkar, Jan-e Alam.


**Conference Proceedings in Journals:**

1. **Equilibration in Quark Gluon Plasma.**

   Santosh K das, Jan-e Alam, Payal Mohanty.


2. **Scaling Quark Gluon Plasma by HBT Interferometry with Lepton Pairs**

   Payal Mohanty, Jan-e Alam

   Proceedings of Science PoS(WPCF2011)040

   Preprint: Nucl-th/1202.2189
Conference Proceedings:

1. **Freeze Out Time in Ultra-Relativistic Heavy Ion Collisions.**
   Santosh K Das, Payal Mohanty, Jajati K Nayak and Jan-e Alam

2. **Flow from Electromagnetic Radiation**
   Payal Mohanty, Jajati K Nayak, Jan-e Alam, Satosh K Das.

3. **Dilepton Interferometry : a Tool to Characterize Different Phases of Collision in HIC**
   Payal Mohanty, Jan-e Alam, Bedangadas Mohanty

4. **Probing Elliptic Flow of QCD Matter by Lepton Pairs**
   Payal Mohanty, Victor Roy, Sabyasachi Ghosh, Santosh K Das,
   Bedangadas Mohanty, Sourav Sarkar, Jan-e Alam, Asis K Chaudhuri
   Proceedings of DAE Symp. on Nucl. Phys. (India) **56** (2011) 910

5. **Thermal Radiation from an Expanding Viscous Medium**
   Sukanya Mitra, Payal Mohanty, Sourav Sarkar, Jan-e Alam
   Proceedings of DAE Symp. on Nucl. Phys. (India) **56** (2011) 936

6. **Dilepton Interferometry at Different Collision Energies**
   Payal Mohanty, Jan-e Alam, Bedangadas Mohanty
   Proceedings of DAE Symp. on Nucl. Phys. (India) **56** (2011) 960
Notation and Conventions

In the thesis, I have used the natural units, $\hbar = c = k_B = 1$. The matrix tensor used is $g^{\mu\nu} = \text{diag}(1, -1, -1, -1)$. Variables in bold face denote 3-vectors. Most of the notation is introduced during the discussion and the frequently used notations are enlisted below:

$N - N$  Nucleon-Nucleon
$p - p$  proton-proton
$p - A$  proton-Nucleus with mass number A
$A - A$  Nucleus-Nucleus with mass number A
$s, t, u$ Madelstam Variables, where
$s = (p_1 + p_2)^2$,  $t = (p_1 - p_3)^2$,  $u = (p_1 - p_4)^2$
$\mu_B = \mu$  Baryonic chemical potential
$\tau$  Proper time ($= \sqrt{t^2 - z^2}$)
$y$  Particle rapidity ($= \frac{1}{2} \ln \left[ \frac{E + p_z}{E - p_z} \right]$)
$\eta$  Space-time rapidity ($= \tan^{-1}(t/z)$), thus $t = \tau \cosh \eta$ and $z = \tau \sinh \eta$
$M$  Invariant mass of lepton pairs
$p_T$  transverse momentum
$M_T$  transverse mass of lepton pair ($M_T^2 = M^2 + p_T^2$)
$m_T$  transverse mass of hadron with mass, $m_h$ ($m_T^2 = m_h^2 + p_T^2$)
$\epsilon$  Energy density
$P$  Thermodynamic pressure
$s$  Entropy density
$V$  Vector mesons
$\tau_i$  Thermalization time
$T_i$  Thermalization temperature
$T_c$  Transition temperature
$T_{ch}$  Chemical freeze-out temperature
$T_f$  Thermal freeze-out temperature
$d^4x$  four-volume
$K$  average pair momentum ($= (p_1 + p_2)/2$), off-shell
$q$  relative pair momentum ($= p_1 - p_2$), off-shell