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Lina Wu* (lwu@bmcc.cuny.edu), 529 West 42nd Street Apt. 5K, New York, NY 10036. *Studying the Harmonic Differential Forms under Appropriate Growth Estimates by Extending the Scope of L^q to Non- L^q Space.* Preliminary report.

- It is well-known that on a compact Riemannian manifold, a differential form ω is closed (i.e. $d\omega = 0$) and co-closed (i.e. $d^*\omega = 0$) if and only if it is harmonic (i.e. $\Delta\omega = (dd^* + d^*d)\omega = 0$).

$$\Delta\omega = 0 \iff d\omega = d^*\omega = 0$$

- On a complete non-compact Riemannian manifold, A.Andreotti and E.Vesentini proved the equivalence between a differential harmonic form and a closed co-closed differential form in L^q space for $q = 2$.
- In this talk, we will discuss the equivalence between a harmonic form and a closed co-closed form on a complete non-compact Riemannian manifold that is not necessarily in L^2 space and is not necessarily in L^q space for any $q \neq 2$. We generalize the work of A.Andreotti and E.Vesentini. This is my joint work with Dr. Shihshu Walter Wei.

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