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UNIQUENESS OF $\mathcal{L}$-FUNCTION WITH CERTAIN POLYNOMIAL OF MEROMORPHIC FUNCTION SHARING A SMALL FUNCTION

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Abstract: This study investigates the uniqueness properties of $\mathcal{L}$-functions associated with meromorphic functions that share a small function of finite weight. Based on the Value Distribution Theory of Nevanlinna and the uniqueness properties of $\mathcal{L}$-functions, we establish several theorems that demonstrate the conditions under which two $\mathcal{L}$-functions can be considered equivalent, particularly in the context of their shared values and the behavior of associated polynomials. Our results extend, generalize, and improve those of Mandal and Datta [10]. We also provide an example that supports our results and poses open questions regarding the relaxation of conditions in uniqueness theorems.

Keywords and Phrases: Uniqueness, Meromorphic function, difference-differential polynomial, $\mathcal{L}$-function, Set sharing, Small function.

2020 Mathematics Subject Classification: 30D35.

1. Introduction and Main Results

For a long time a lot of attention have been given by many scholars on the Riemann hypothesis. At the outset, we assume that by an $\mathcal{L}$-function we always mean an $\mathcal{L}$-function $\mathfrak{L}$ in the Selberg class which includes the Riemann zeta function