Definition 1. *Let the M-transform be defined by*

$$\mathcal{M}\phi(\xi) := \sqrt{2}\int_0^{+\infty} \cos(\xi\sqrt{u})\frac{\phi(u)}{\sqrt{u}}du$$

Definition 2. *For any function ϕ defined on $\mathbb{R}^+$, let C the operator defined by*

$$C\phi(t) = \phi(t^2), \quad t \in \mathbb{R}$$

For any function even function ϕ defined on $\mathbb{R}$, $C^{-1}\phi$ is a function defined on $\mathbb{R}^+$ by

$$C^{-1}\phi(u) = \phi(\sqrt{u})$$

Definition 3. *We note $\mathcal{S}\left(\sqrt{\mathbb{R}^+}\right)$ the space of ϕ such that $C\phi \in \mathcal{S}(\mathbb{R})$. Let $S_p(\mathbb{R})$ the subspace of even functions that belong to the Schwartz class.*

Proposition 1. $C\mathcal{S}\left(\sqrt{\mathbb{R}^+}\right) = \mathcal{S}_p(\mathbb{R})$

Proposition 2. *The operator $\mathcal{M} : \mathcal{S}\left(\sqrt{\mathbb{R}^+}\right) \longrightarrow S_p(\mathbb{R})$ is a bijection, with inverse*

$$\mathcal{M}^{-1}f = \sqrt{2}\int_0^{+\infty} \cos(\xi\sqrt{u})f(\xi)d\xi$$