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## Silverman-Toeplitz theorem

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Let  $\{a_{mn}\}$  be a double sequence of complex numbers and let  $B$  be a positive real number such that:

1.  $\sum_{n=0}^{\infty} |a_{mn}| \leq B$  for all  $m = 0, 1, 2, \dots$
2.  $\lim_{m \rightarrow \infty} \sum_{n=0}^{\infty} a_{mn} = 1$
3. For every  $n = 0, 1, 2, \dots$ , it is the case that  $\lim_{m \rightarrow \infty} a_{mn} = 0$

Then, if the sequence  $\{z_n\}$  converges, the series  $\sum_{n=0}^{\infty} a_{mn} z_n$  converges and

$$\lim_{n \rightarrow \infty} z_n = \lim_{m \rightarrow \infty} \sum_{n=0}^{\infty} a_{mn} z_n$$