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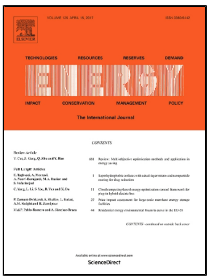

Theoretical, experimental, and numerical study of special impeller used in turbine mode of centrifugal pump as turbine

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**Highlights:**

- The calculation expression of the velocity moment at impeller inlet is deduced.
- A special impeller with the forward-curve blades in the PAT is designed.
- The special impeller has obvious superiority comparing with the original impeller.
- The numerical and experimental investigations have been performed.
- A prediction method of BEPs' flow rate in PAT's turbine mode was provided.

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