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On the crashworthiness analysis and design of a lateral corrugated tube with a sinusoidal cross-section

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**Highlights**

- A lateral corrugated tube with novel sandwich structures in the center is proposed.
- The sinusoidal functions are introduced into the design of cross section of the tubes.
- The lateral corrugated tubes can improve the interaction effect of the crashworthiness.
- The increased value of energy absorption caused by interaction effect is up to 35.6%.

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