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Level set-based topology optimization with overhang constraint: Towards support-free additive manufacturing

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- A level set method for topology optimization with overhang constraint is proposed.
- The new constraint is stated as domain integral of gradient of level set function.
- The domain integral form facilitates violation detection of overhang angles.
- The optimization method can handle arbitrary initial designs and overhang angles.
- Support-free designs are achieved mainly by adjusting local overhang features.
- Optimized designs satisfy overhang constraints without much loss of stiffness.

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