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Buckling and crumpling of a compressed thin-walled box TUOMAS TALLINEN, University of Jyvaskyla, JAN ÅSTRÖM, CSC - IT Center for Science, JUSSI TIMONEN, University of Jyvaskyla — Vertical compression of an elastic thin-walled box is explored. Such a compression displays three successive regimes: linear, buckled and collapsed. Analogy of the buckled regime to thin-film blisters is demonstrated. The compression force is shown to reach its maximum at the end of that regime, after which the box collapses displaying features (e.g. ridges) typical of crumpling of thin sheets. These qualitative findings are confirmed by numerical simulations based on a discrete element method, and implications are drawn on the box compression strength.

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