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solution to the thermoelastic wave induced by pulsed laser heating is derived.

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Based on this solution, calculations are conducted and the results are presented in Sect. 2. 1 Theoretical analysis In this section, solutions to the thermoelastic wave induced by pulsed laser heating are derived. To do so, the laser pulse

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Fig. 1 presents typical modelling results for a 50  $\mu\text{m}$  powder layer irradiated with 30 W laser beam with a bell-shaped radial distribution of incident power density  $Q$  characterised by the full width (diameter) at half-maximum FWHM of 60  $\mu\text{m}$ . Net laser energy flux density  $Q$  (a) and volumetric heat source  $U$  (b) are estimated by Eqs. , , .

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2.2. Weld bead upper face modelling. The modelling of the heat transfer from the

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evolving from Rosenthal's basic analytical model progressing into Goldak's continuum model. Initially considered in a welding context, these two basic models are adaptable and are commonly used for laser heating processes. DIABLO, a continuum thermomechanical model associated with the Lawrence Livermore National Laboratory, is reviewed. The

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The part dimensions used for this analysis, as well as the laser and model parameters, can be seen in Table 1. The central nodes of the x-axis of the top four part layers (the first, in z-axis, node in each layer) of the part will be used for the test at hand.

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