Application of WIAS-TeSCA to the analysis of the power limits of semiconductor lasers

Hans Wenzel

Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik
Gustav-Kirchhoff-Straße 4, 12489 Berlin, Germany

hans.wenzel@fbh-berlin.de

The factors that limit both the continuous wave and the pulsed output power of broad-area laser diodes driven at very high currents are investigated theoretically and experimentally. The decrease in the gain due to self-heating under CW operation and spectral holeburning under pulsed operation as well as heterobarrier carrier leakage and longitudinal spatial holeburning limit the maximum achievable output power.