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**Late time nonlinear hydrodynamic instabilities evolution– theoretical and numerical investigation.** SHVARTS DOV[1], YONATHAN ELBAZ[2], NACHLIEL WYGODA[3], Nuclear Research Center Negev, ISRAEL — The dependence of the instability dynamics on the initial conditions (amplitude and spectrum) was studied numerically and analytically, using a mode coupling extension to Haan's and Ofer's models. Regimes of initial conditions, in which the growth rate of the instabilities are dominated either by the initial conditions or by mode coupling, were identified. Using these modal models in the mode coupling regime we were able to determine the different asymptotic power laws and coefficients of the growth rates of the different instabilities and present new relationships between them. Comparison between the newly derived power laws and those obtained in experiments, full numerical simulations and bubble competition models, in two and three dimensions, will be discussed.

[1]also at the Ben Gurion University, ISRAEL and the Laboratory for Laser Energetics, University of Rochester
[2]also at the Ben Gurion University, ISRAEL
[3]also at the Hebrew University, ISRAEL

Dov Shvarts
Nuclear Research Center Negev, ISRAEL

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