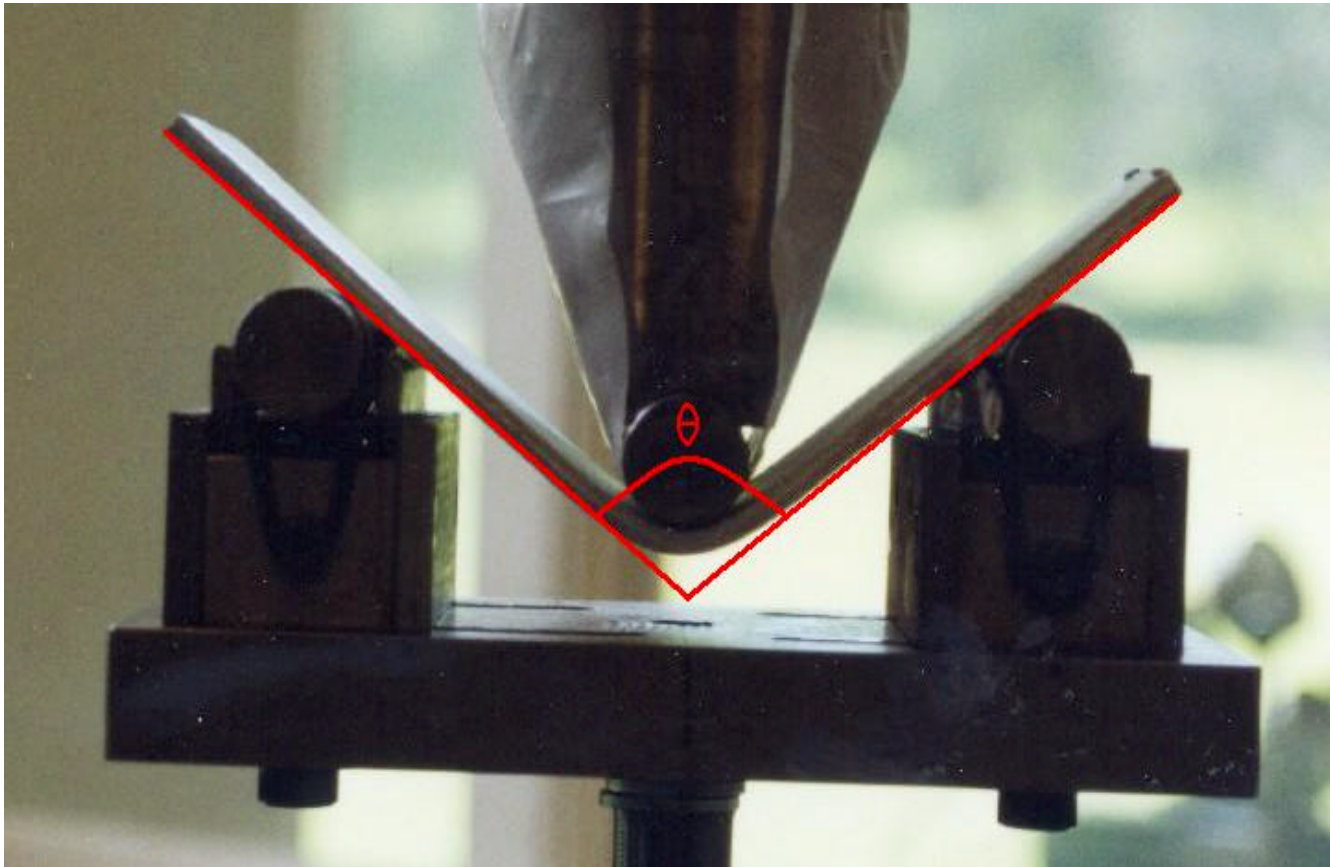


Sheet metal forming - a preliminary study of modeling the bending phenomena

By

Elisabeth Hovda and Henry Valberg
NTNU, Dept. of Machine Design and
Materials Technology

MAJOR PROBLEM IN SHEET BENDING: **SPRINGBACK** **PREDICTION**



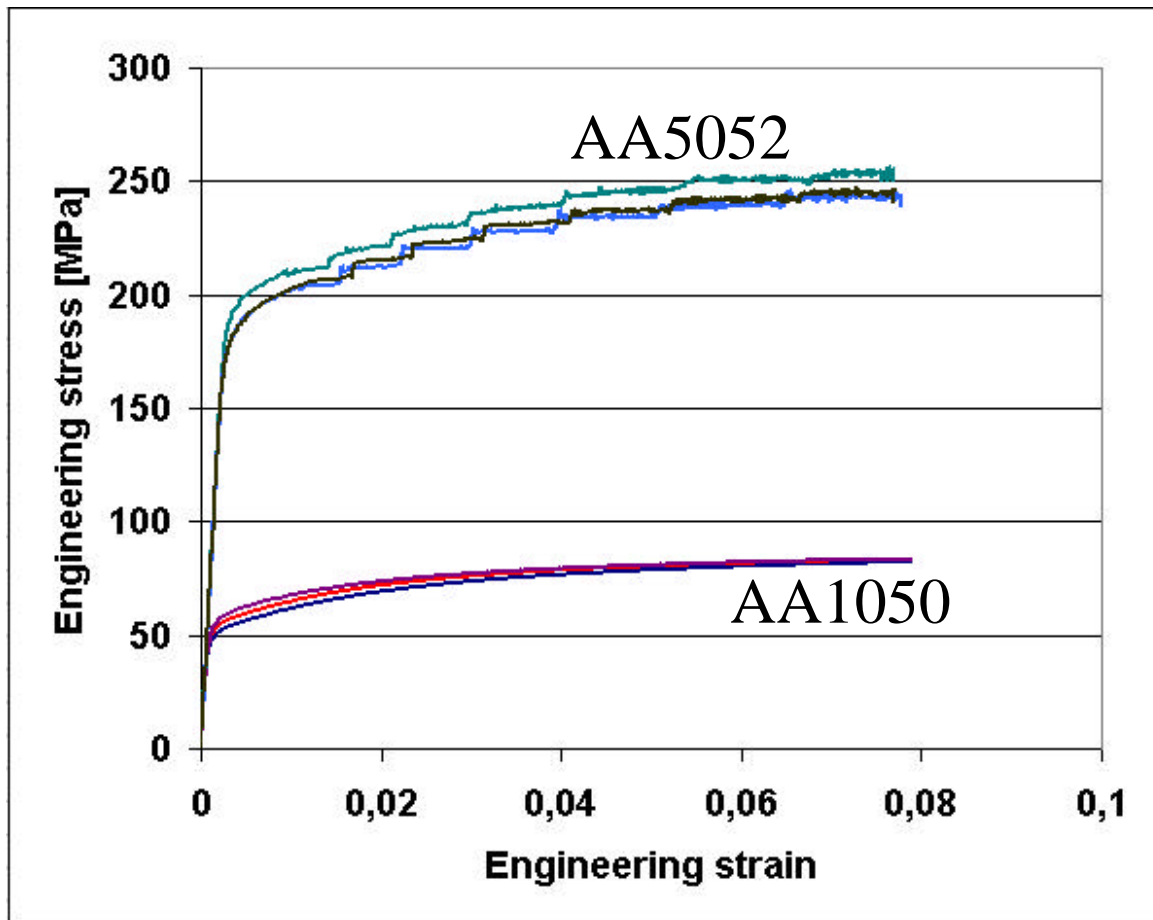
AIR-BENDING:

SMALL BATCH
MANUFACTURING

VARIOUS BENDING
ANGLES

NO CHANGE OF
TOOLS

MATERIAL DATA FOR AA1050.25 AND AA5052 H32



AA5052 H32:

ANISOTROPIC

DUCTILE

THICKNESS = 2.5MM

AA1050.25

ISOTROPIC

DUCTILE

THICKNESS = 4.54MM

METHOD PROCESS

ANALYTICAL METHODS: SIMPLIFIED AND

$$r_{ic} = \frac{t}{2} \left(\frac{1}{\exp\left(\frac{n(1+R)}{2\sqrt{1+2R}}\right) - 1} - 1 \right)$$

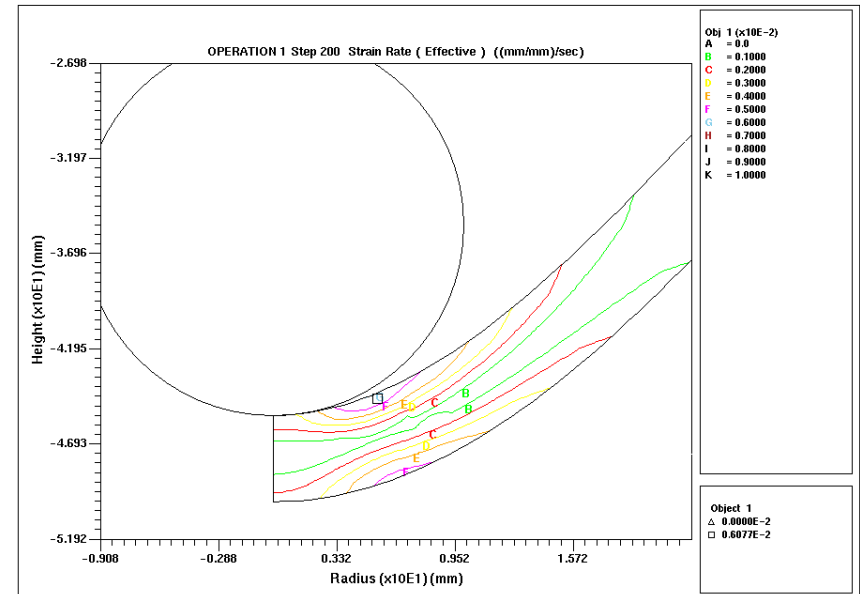
APPROXIMATED

NUMERICAL METHODS:

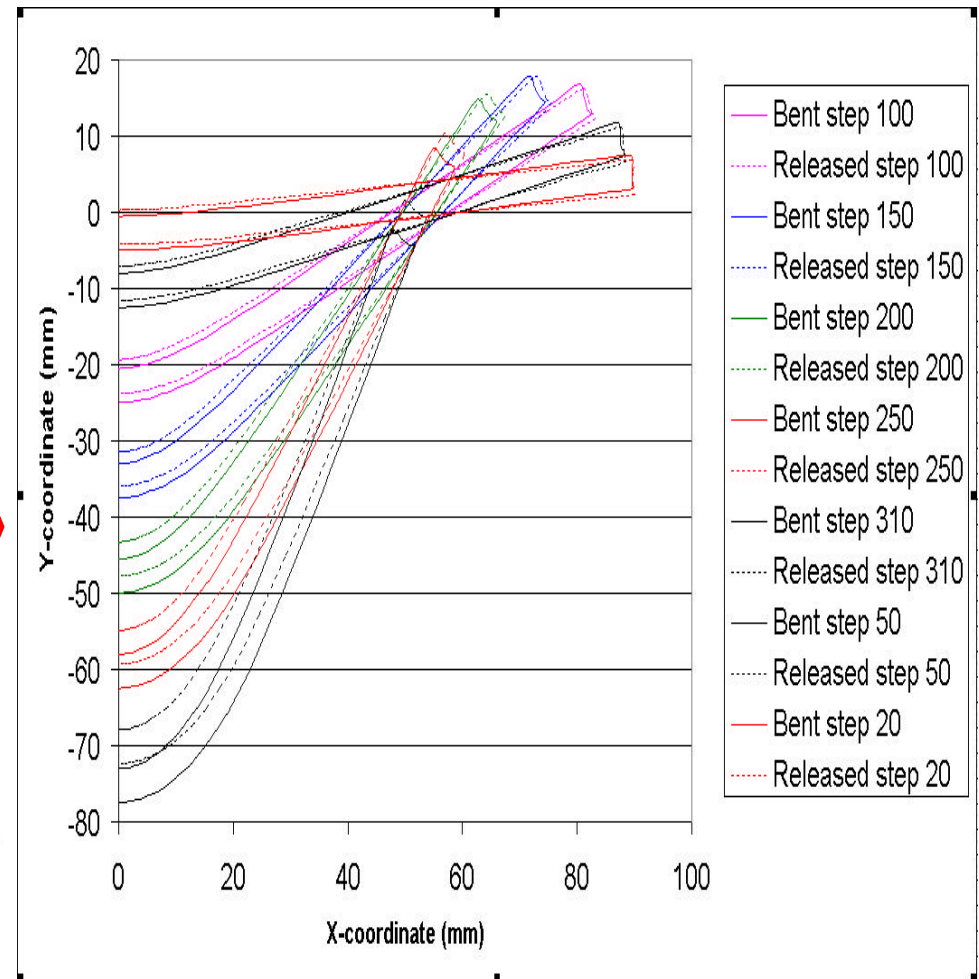
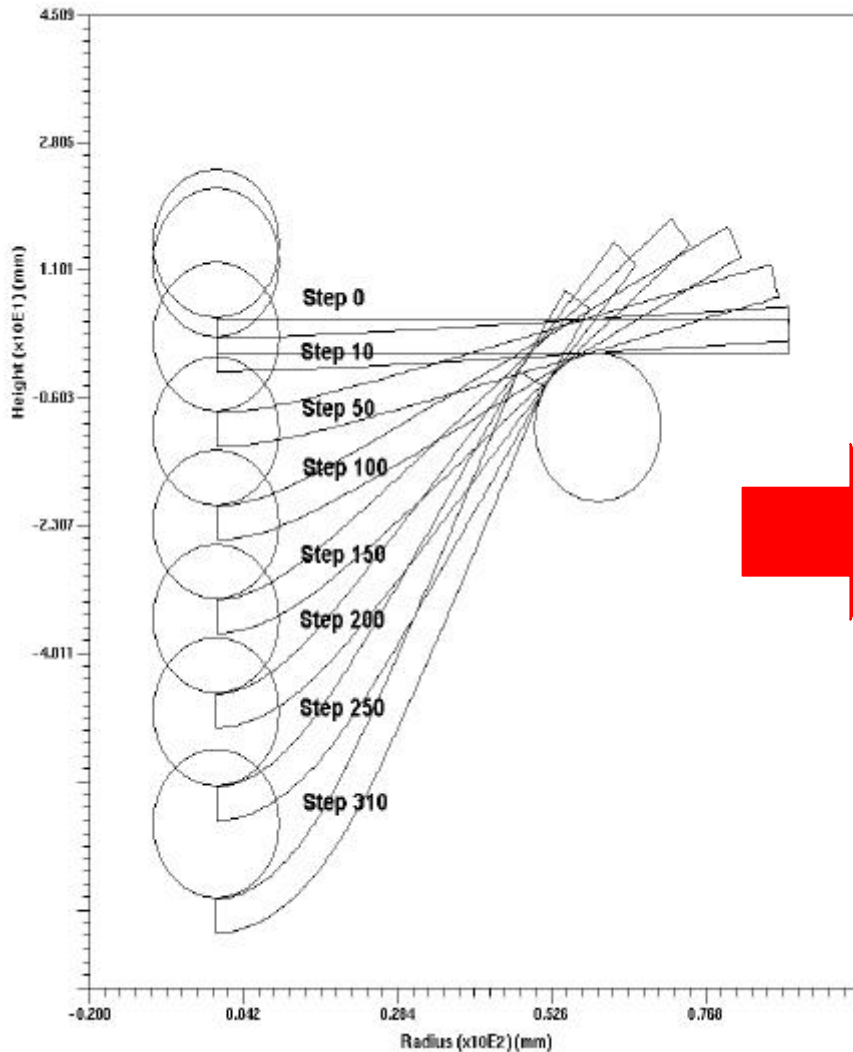
MORE PROCESS ALIKE



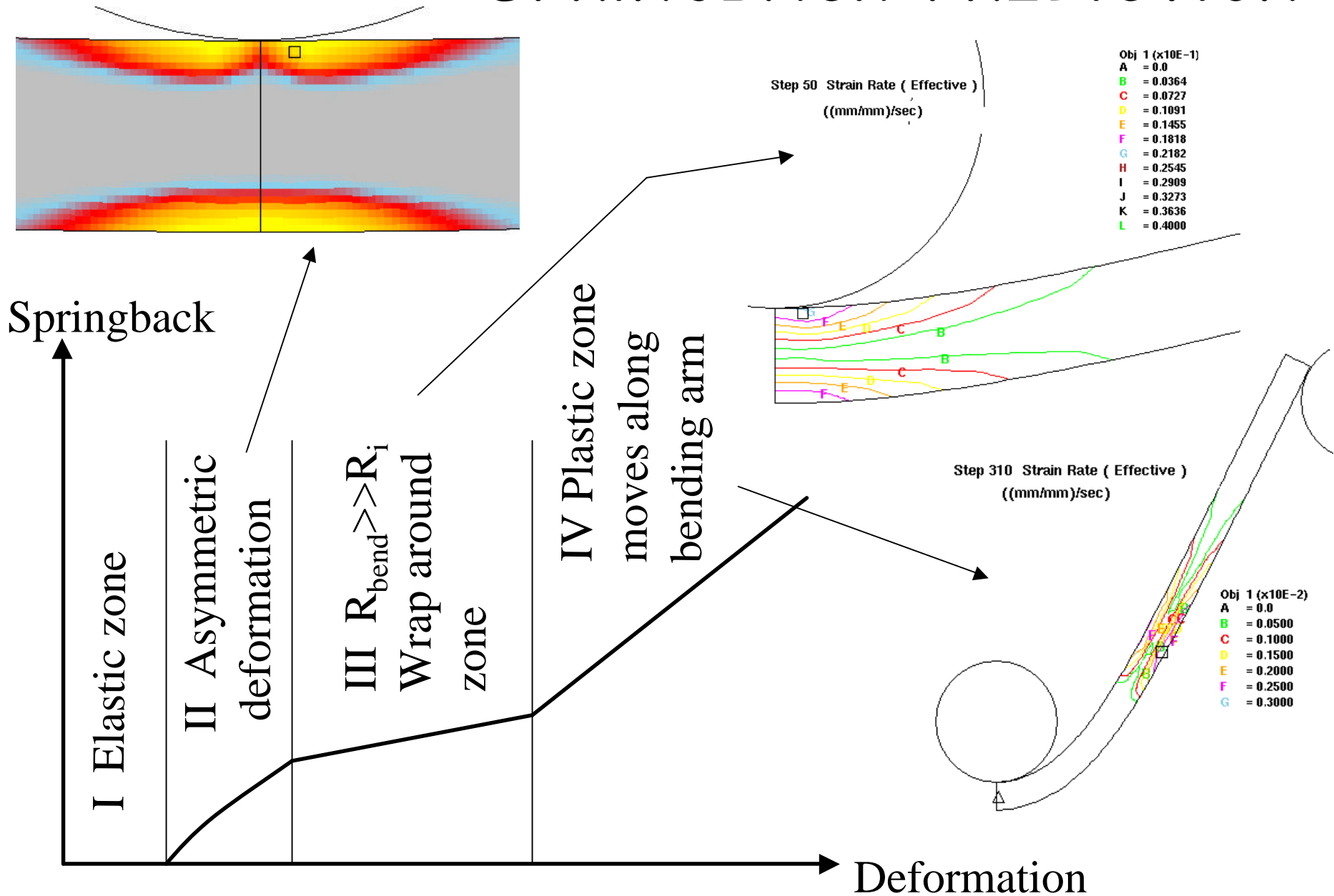
MORE ACCURATE



FEM-SIMULATIONS USING DEFORM2D



SPRINGBACK PREDICTION



FURTHER AIM: ANALYSING AND UNDERSTANDING SHEET METAL FORMING PROBLEMS

