GENOA PARAMETRIC ROBUST DESIGN (PRD)

GENOA Parametric Robust Design is an add-on package that allows users to generate sets of designs based on parametric capabilities of commercial FE software by varying user-defined parameters. The parametric design results can be sorted based on specific criteria: damage initiation/propagation, fracture initiation/propagation, ultimate loading, weight, and volume. Comparison plots are for the 5 considered best designs based on load/displacement curves, damage volume/energy, strain energy, damage energy release rate (DERR), weight, and volume.

✓ **Generates sets of designs based on parametric capabilities of commercial FE software by varying user-defined parameters:**

   o **Geometry: dimension, thickness**
   o **Mesh: mesh-seed, element size**
   o **Loads & Boundary conditions: force/displacement intensity**
   o **Material uncertainties: mechanical properties**
   o **Manufacturing defects: ply orientation, ply thickness, void volume ratio, fiber volume ratio.**

Key Benefits

- Improves design durability and reliability.
- Decreases time to generate a large number of design configurations by relying on parameter deviation and incremental steps.
- Enables efficient and exhaustive probabilistic analysis due to wide range of parameters' variations.
- Can reduce and delay failure due to delamination, shear stress, fiber buckling, damage volume ratio.
- Compares geometries and eventually assesses an improved design based on user-defined criteria.

  Step by step tutorial with manual and i/o files assist user in doing these simulations.
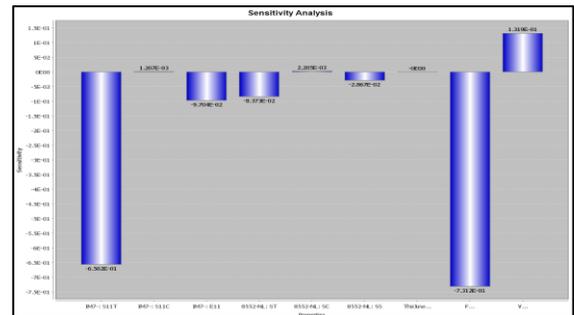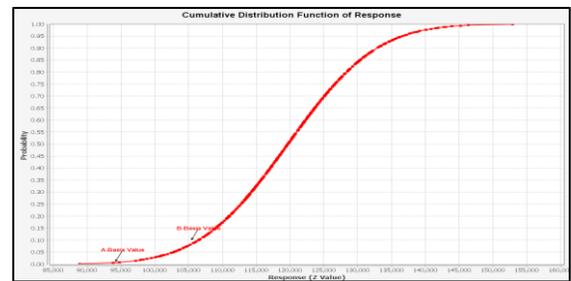
System Requirements

- Requires GENOA Standard Edition to be installed on CVT server for analysis.
- Windows XP/Vista/7/8 or Linux (64-bit)
- Java 1.7 minimum Runtime Libraries

Minimum Configuration

  With the minimum configuration, performance and

  Functionality may be less than expected.

- 1 GHz or higher CPU, 4GB RAM, 10GB disk space

CDF and Sensitivities for All Manufacturing and Geometric Variables Considered

Corporate Headquarters
Alpha STAR Corporation
5150 East Pacific Coast Highway Ste. 650
Long Beach, California 90804 USA
Telephone: (562) 961-7827
Sales: info@alphastarcorp.com
Support: support@alphastarcorp.com

European Offices
Alpha Consulting Services
Via A. Silvani 118
00139 Roma
Telephone: +39 328 7041 876
Sales:
info@alphaconsultingservices.it

For more information:
http://www.alphastarcorp.com/

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GENOA: PFA, PFDA, UAB, URD, ABS, PCP, PA, Quasi Static Fatigue & Random Fatigue, Harmonic & PSD Fatigue, Fatigue with Fracture Mechanics, PFA_AGING, VCCT, DCZM, Filament Winding, Jobspooler, GENOA_CLOUD