

**CENTER FOR THE ADVANCEMENT OF NATURAL
DISCOVERIES USING LIGHT EMISSION**

**ULTRAFAST BEAMS AND
APPLICATIONS 17-23 JUNE
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**STRESS-STRAIN RESEARCH OF THE
ACCELERATOR OUTPUT WINDOWS WITH
MECHANICAL CONNECTION**

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**THE RESEARCH WAS SUPPORTED BY THE HIGHER EDUCATION AND SCIENCE COMMITTEE OF
MESCS RA (RESEARCH PROJECT № 23AA-2D015)**

INTRODUCTION

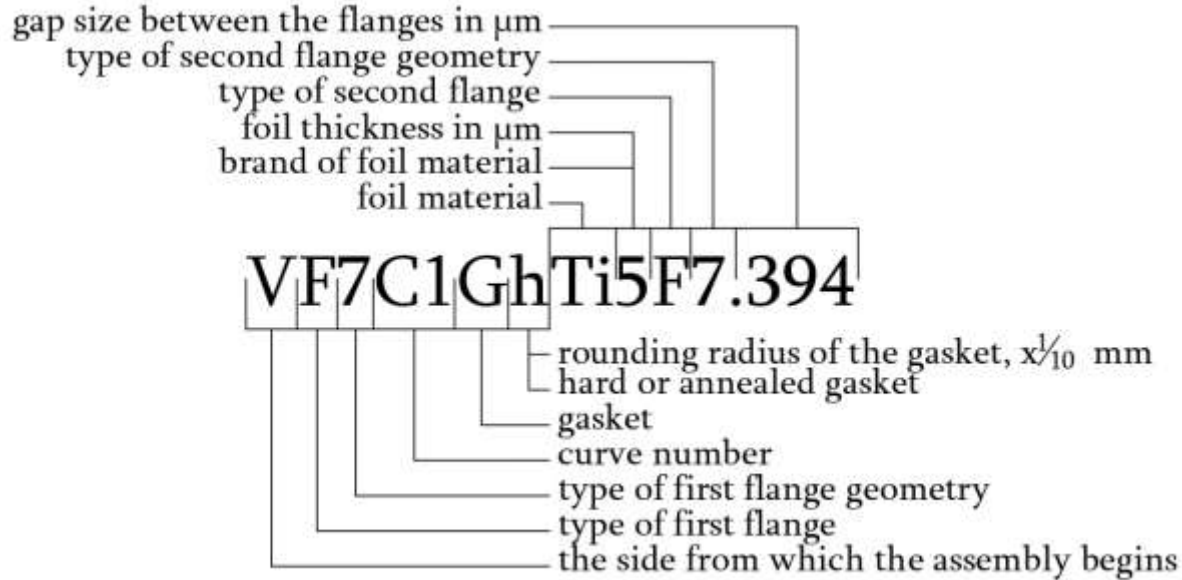
THE STUDY RELATES TO ACCELERATOR TECHNOLOGY, IN PARTICULAR, THE OUTPUT WINDOW UNIT. THE TASK IS TO OBTAIN THE MOST OPTIMAL DESIGN OF THE ACCELERATOR OUTPUT WINDOW, WHICH WILL BE VACUUM-TIGHT. THE FOCUS OF THE WORK IS ON TWO CHARACTERISTICS OF THE METAL FILM: THE THINNER THE METAL FILM, THE LESS LOSS OF BEAM PARAMETERS PASSING THROUGH IT. HOWEVER, THE THINNER THE METAL FILM, THE HIGHER THE PROBABILITY OF ITS RUPTURE. IT CAN BE SAID THAT THESE TWO CHARACTERISTICS ARE RIVALS.

SEVERAL SIMULATIONS ARE CARRIED OUT TO INVESTIGATE THE STRESS-STRAIN STATE OF THE OUTPUT WINDOW UNIT. RESEARCH INTEREST IS LAID ON THE CENTRAL NODES OF THE TITANIUM FOIL, AND THE SEALING ZONE OF THE OUTPUT WINDOW. COMPARATIVE ANALYSIS AND CURRENT CONCLUSIONS WERE CARRIED OUT FOR FURTHER EXPERIMENTAL RESEARCH CONDUCTION.

ACCELERATOR OUTPUT WINDOW



ASSIGNMENT

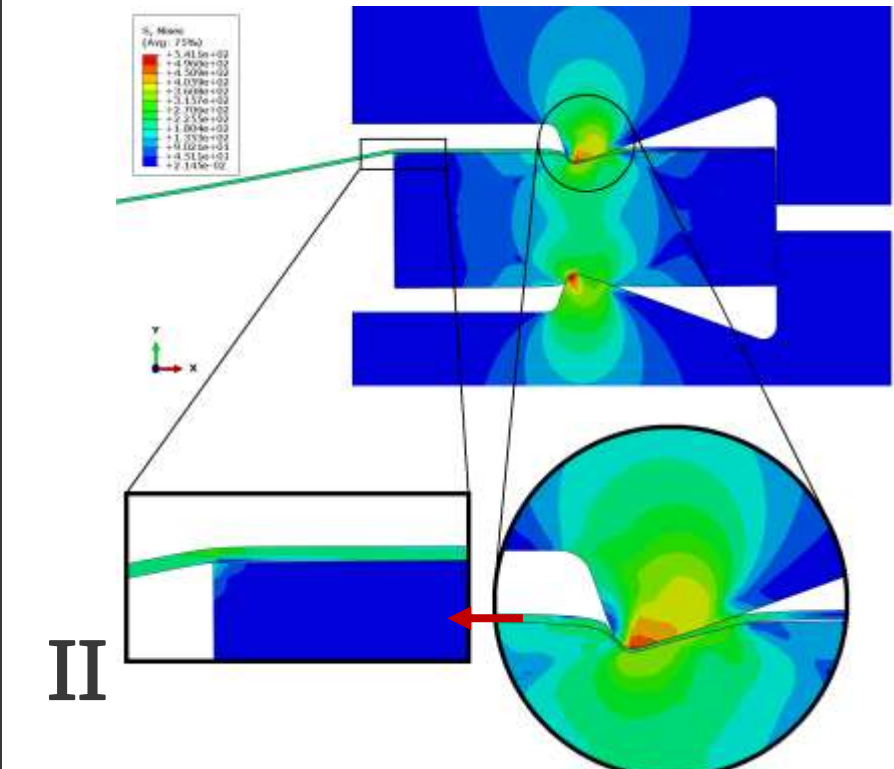
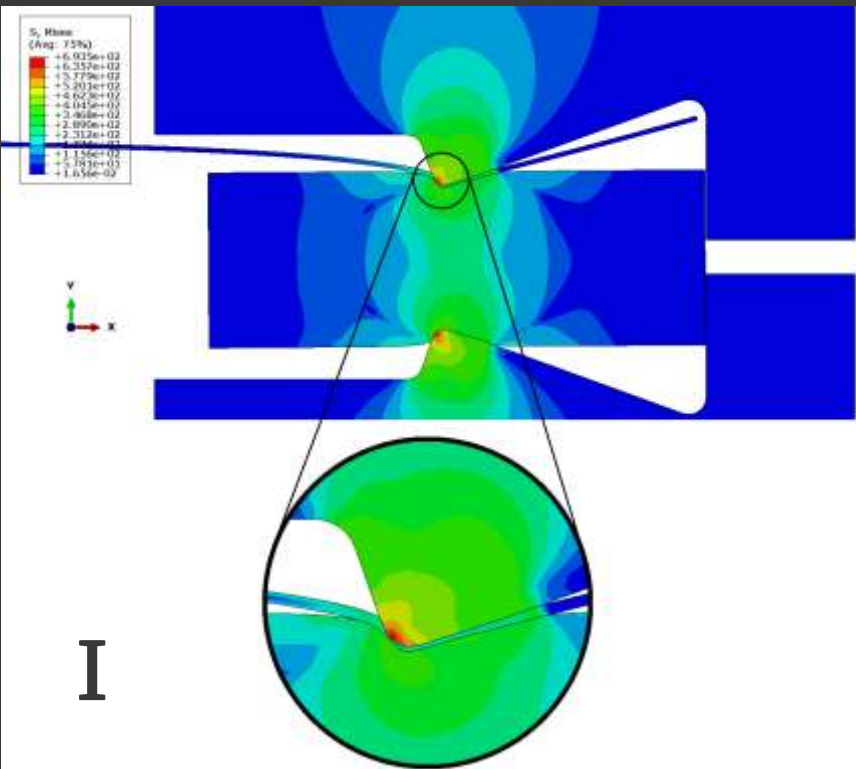


SIMULATIONS

	Model	Gap	State	Result
1	VCFGh0TiCF	050	Failed	Unsatisfied
2	VCFGh0TiCF	394	Completed	Satisfied
3	VCFGh025TiCF	394	Completed	Unsatisfied
4	VCFGh05TiCF	394	Completed	Unsatisfied
5	VCFGh075TiCF	394	Completed	Satisfied
6	VCFGh10TiCF	394	Completed	Satisfied
7	VCFGh15TiCF	394	Completed	Satisfied
8	VCFGh20TiCF	394	Completed	Satisfied
9	VCFGs0TiCF	345	Completed	Satisfied
10	VCFGs01TiCF	345	Completed	Satisfied
11	VCFGs025TiCF	345	Completed	Unsatisfied
12	VCFGs025TiCF	345	Completed	Unsatisfied
13	VCFGs05TiCF	345	Completed	Satisfied
14	VCFGs075TiCF	345	Completed	Unsatisfied
15	VCFGs10TiCF	345	Completed	Unsatisfied
16	VCFGs15TiCF	345	Completed	Unsatisfied
17	VCFGs20TiCF	345	Completed	Satisfied

Ti Grade-2
Foil thickness-50 μ m

VCF709012GHOTIGR250CFGAP394



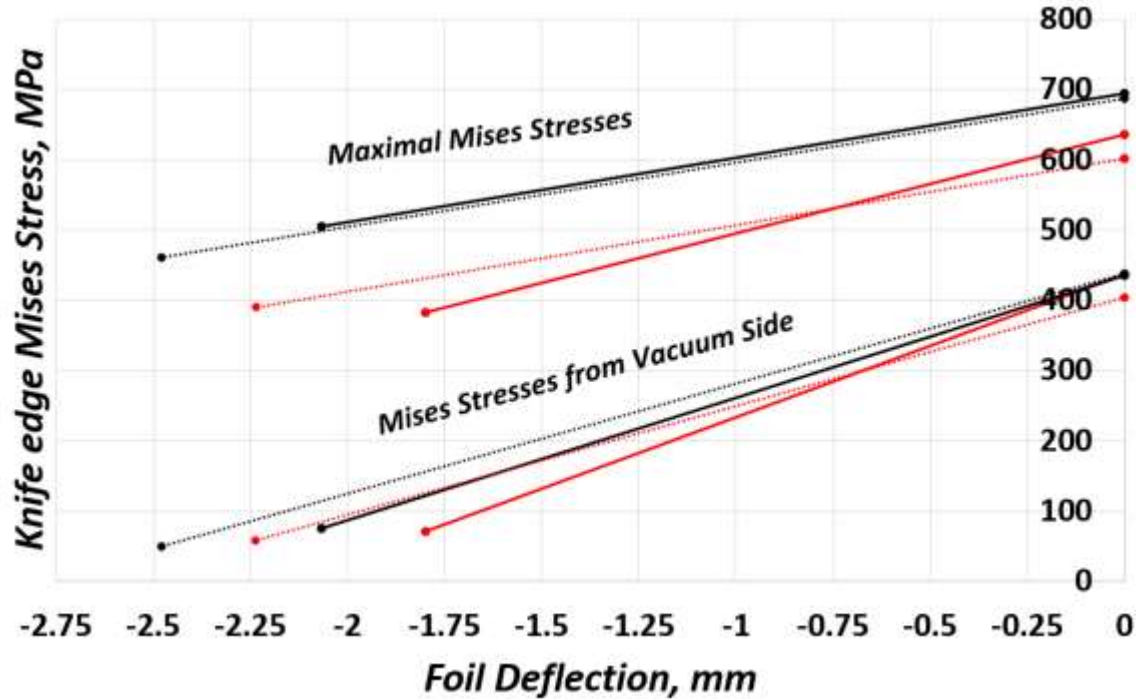
STRESS RELAXATION AFTER VACUUM PUMPDOWN

 HARD GASKET, R=0 MM

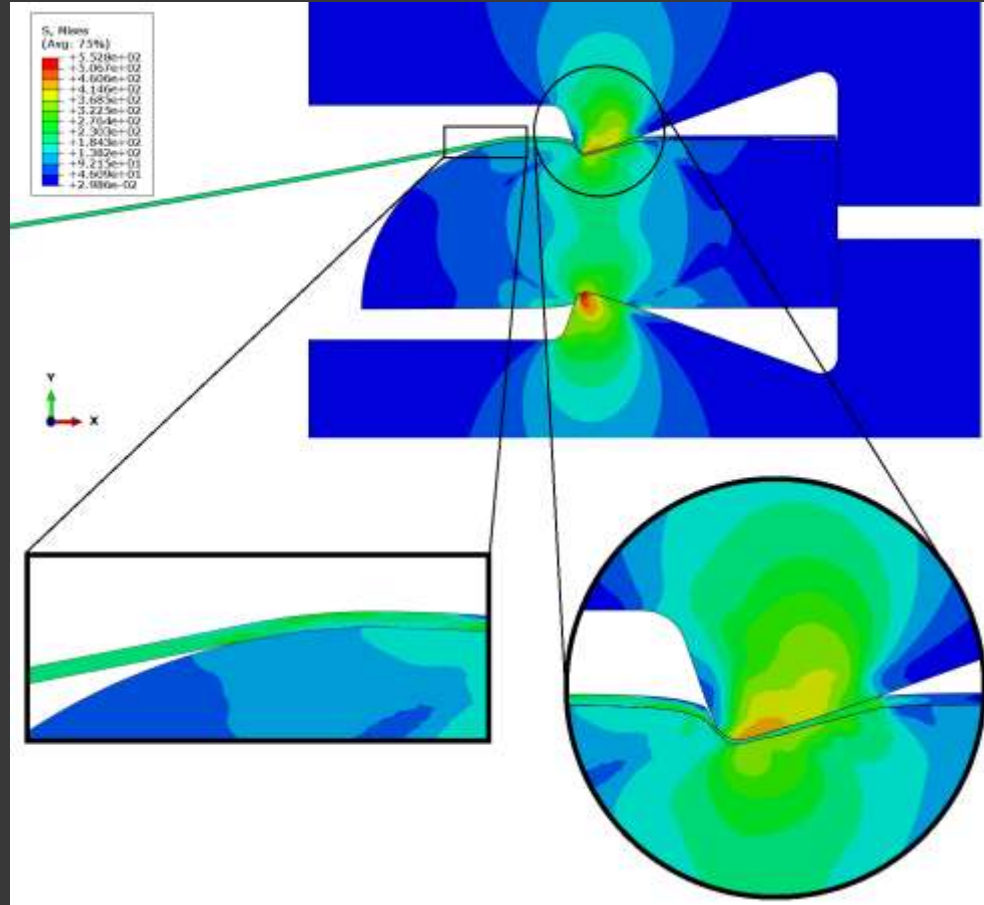
 SOFT GASKET, R=0 MM

 HARD GASKET, R=2 MM

 SOFT GASKET, R=2 MM

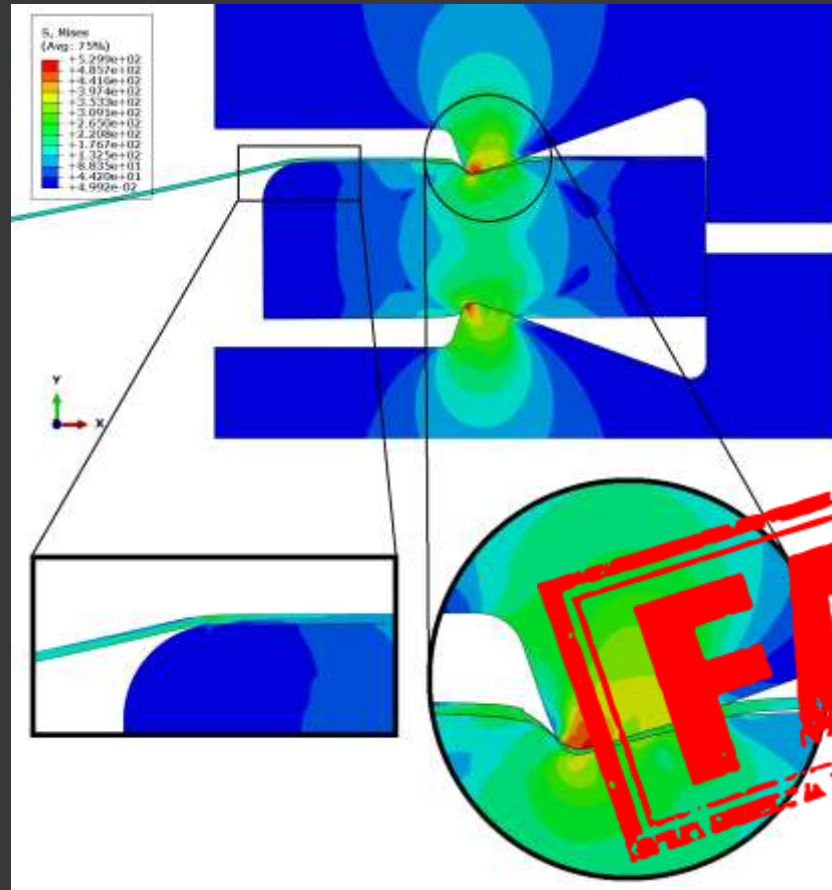


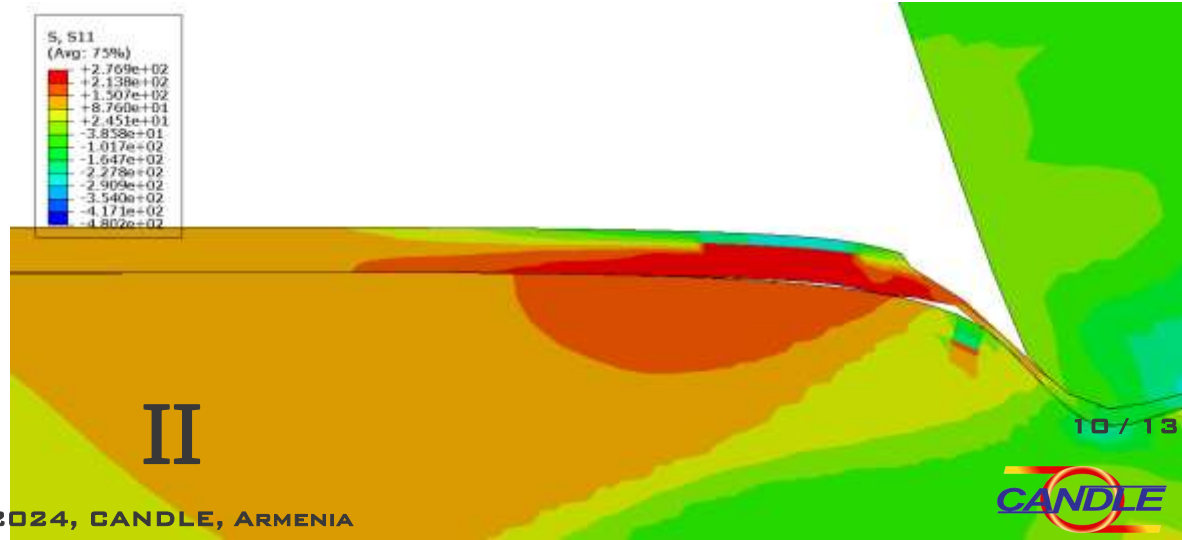
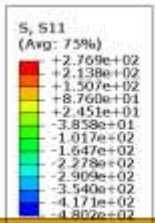
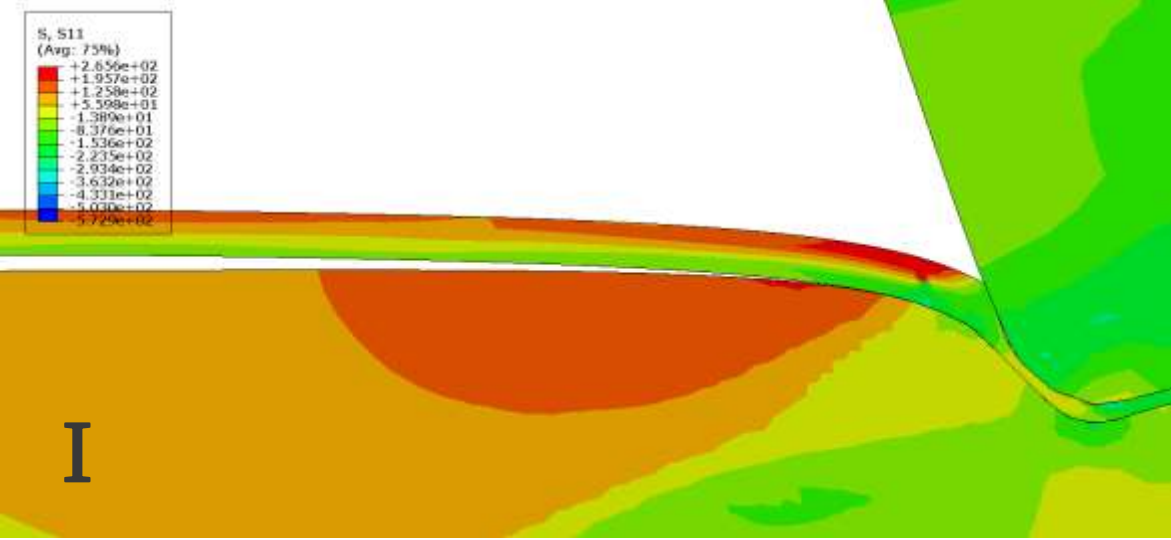
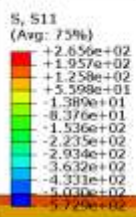
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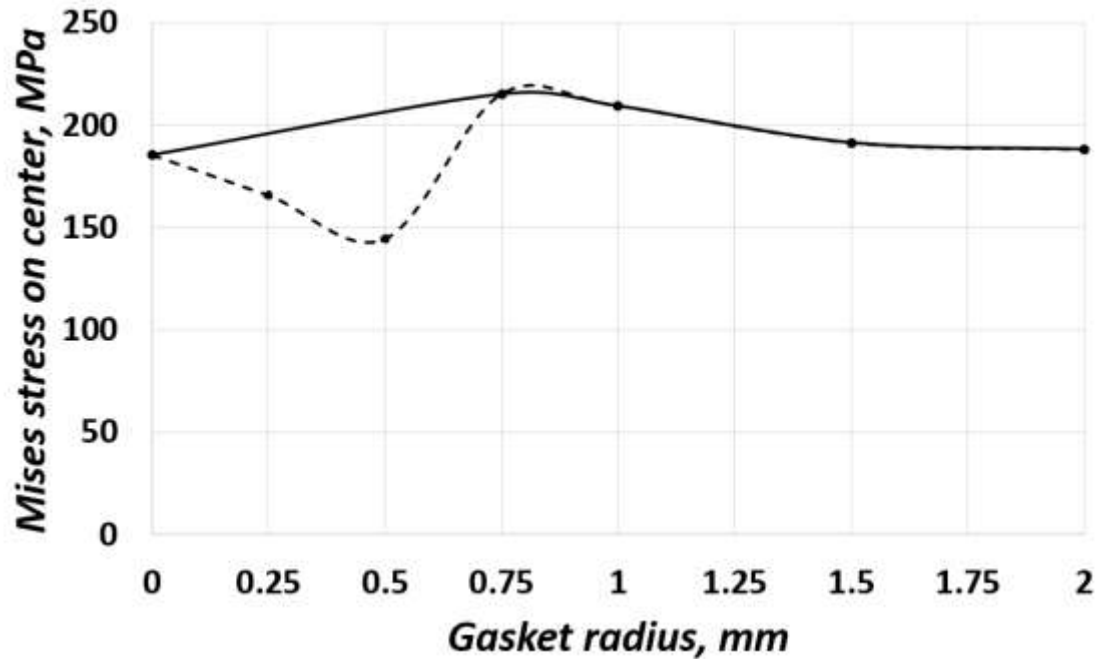
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- HARD GASKET
R=0,25
- HARD GASKET
R=0,5

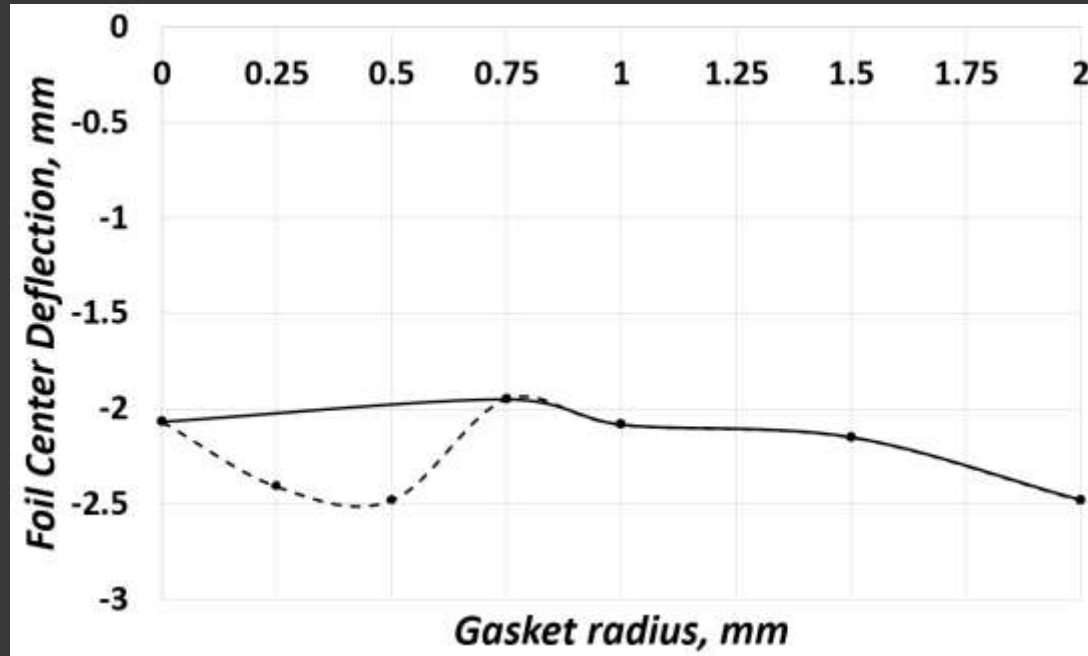




FOIL CENTER STRESSES FROM VACUUM SIDE



FOIL CENTER DEFLECTION FROM VACUUM SIDE



THANKS