SHARE: f 💢 Join Our Email List **SPEAKING ENDURICAN** Endurica
Get Durability Right **Endurica has** 265 words | 1 minute read Endurica CL now uses multithreading to quickly create high resolution Haigh diagrams. The Endurica Viewer can set axis limits for Haigh diagrams, and has improved plotting to create a smoother contour plot. Endurica Viewer also has a READ MORE Updated Haigh diagram graphic Haigh diagram graphic before 2023-0601 release **Crack Growth or Continuum Damage? Endurica does both** 0 Crack Growth Rate log (r [mm/cycle]) Endurance limit/ slope = F Intrinsic strength ultimate -12  $\log (T [J/m^2])$ Tearing Energy Figure 2. Typical Crack Growth Rate vs Tearing Energy Plot 965 words | 4 minute read The topic of whether to use a crack growth method or a continuum damage method for product fatigue and durability assessment has long been debated. Oftentimes, experts will recommend using a continuum damage approach in the initial phase, when no noticeable cracks are present, and then transition to a crack growth analysis when damage has reached a certain level where **READ MORE Predicting Residual Casing Life** of a Tire following an Impact Event We are excited to share with you a Research Article published June 22, 2023 in *Tire* Science and Technology by Gobi Gobinath, Thomas Ebbott, and Shannon Hughes. ABSTRACT: By applying recognized engineering methods, including finite element analysis, the role of impact events on the service life of a tire was studied by varying three factors: speed of impact, treadwear, and angle of impact. The approach combines wellknown finite element analysis methods to simulate a tire rolling over an obstacle with the calculation of damage at the tire belt edge imparted by the impact event by using recognized methods of rubber fatigue analysis. An efficient method is developed and used to demonstrate that across a range of impact conditions, some conditions can cause substantial internal damage, whereas other conditions can cause very little damage. The area of investigation is the tire belt edge; thus, although significant internal damage may have occurred, it might not be visually perceptible in the normal operation of a vehicle. In some cases, the nondetectable damage is shown to propagate to a point where the tire loses its structural integrity before reaching its normal operating life defined by treadwear. This study includes the role of mechanical, temperature, and rate effects. Link to full article: https://doi.org/10.2346/tire.23.22003 **THANKS JOE!** Joe Suter, our Financial Manager, has been with Endurica for 10 of our 15 years... We appreciate you and can't thank you enough Joe! **Endurica Selected as Technology Partner** in Department of Energy Grant to Coreform to Explore Simulation of Advanced Tire Tread Simulate fully detailed CAD tread models without time-consuming tread meshing Isogeometric analysis tire simulation Immerse a fully detailed CAD model (1) in a simple bounding hex mesh (2) to run a fully detailed tread simulation (3) 410 words | 2:00 minute read Innovative tire tread computer simulation processes aimed at accelerating the use of simulation in the tire industry is the mission of an exploratory grant awarded to Coreform by the United States Department of Energy (DOE). The firm will apply Coreform IGA, their isogeometric analysis (IGA) technology -- which replaces difficult and time-consuming portions of computer simulation work while providing greater design clarity and detail -- to the simulation of the advanced tire tread patterns required by emerging vehicles. To fully implement the grant's scope, Endurica has been selected as a technology partner to provide key tire industry endurance evaluations including rolling resistance, heat build-up and wear behavior. "Coreform's technology promises to revolutionize simulations involving complex geometry," explains William V. Mars, Ph.D., P.E. founder and President of Endurica. "and tire tread patterns are an extremely important example of complex geometry. We are honored to be included in this important research for both the DOE and the tire industry." Traditional finite element analysis (FEA) first requires geometry to be defeatured and meshed which can be both time consuming and relationally inaccurate. IGA was introduced in 2005 to run simulation directly on the design model, leveraging the power of splines. Thousands of scientific papers have been written on this approach and Coreform's novel "Flex IGA" technology unlocks these benefits in a commercial setting. Coreform IGA provides a full spectrum of input options and flexible modeling, allowing engineers to minimize manual effort for a desired solution solve "Greater use of predictive simulation analysis for advanced tire tread designs will reduce the cost of product development and accelerate the adoption of both electric and self-driving cars," explains Coreform Chief Strategy Officer Matthew Sederberg. "We anticipate this project will help the tire industry develop innovative tread patterns to reduce noise and improve energy efficiency." Greg Vernon, Director of Engineering at Coreform, says Coreform's approach will use isogeometric analysis to allow tire manufacturers to test new designs much more quickly. "Down the road, that will mean fewer particulate emissions, longer life, and better energy efficiency for all of us." Coreform develops next-generation computer-aided engineering software. Among Coreform's founders are authorities in isogeometric analysis and widely cited researchers in the computer science field. The Coreform IGA solver is based on smooth CAD spline geometry, offering greater accuracy than the faceted meshes used in legacy CAE software. Coreform is also the exclusive commercial distributor of the Cubit meshing software. Founded in 2014, Coreform is headquartered in Welcome to the Team **Nick Roe Business Intern Bowling Green State University** A junior in the Asian Studies program at Bowling Green State University, Nick joins us for the summer through the Ohio Export Internship Program. He has been busy researching/reaching out to resellers based in Japan, helping with international logistics details and documenting the details of Endurica's entry into the Entrepreneurial Operating System. He is looking forward to January 2024 and his semester abroad in Japan at Nanzan University in Nagoya. **Coming Events 2023** 2023年橡胶疲劳仿真技术会暨 Endurica 疲劳仿真系统培训邀请 主办:易瑞博科技(北京)有限公司 广州科唯仪器有限公司 协办:凯尔测控试验系统(天津)有限公司 点击查看信息 Endurica Training in China August 2-4, 2023 with Dr. Will Mars 2 Day Training Course Simulating **Elastomer Durability** with Endurica Workflows 22nd & 23rd August 2023 @ Pune 25th & 26th August 2023 @ Bangalore **Rubber Durability** Analysis  $N_f(\theta, \varphi) = \int_{a_{\theta}}^{a_f} \frac{1}{r(T(\theta, \varphi, a))} da$ **Endurica** dhio conter for excelle Endurica Training in India August 21-22, 2023 in Pune, August 24-25, 2023 in Bangalore with Dr. Will Mars 42nd Annual Conference 2023 Conference Theme: Intelligent Tire September 12 - 13, 2023 The University of Akron, Akron Campus, Akron Ohio I Speak FRIDAY, OCT. 6, 2023 @ 9:00 AM EDT Fatigue Ninja Friday events are deep-dive training sessions on new features in our software codes. These webinars are presented at no charge to our users. If you are a client and are not receiving invitations to join us please email Pauline Glaza. October 4-5, 2023 Huntington Place, Detroit, Michigan, USA International • Elastomer Conference October 16-19, 2023 • Cleveland, OH **IRC** INTERNATIONAL RUBBER CONFERENCE 2023 Intelligence and Low Carbon, Create a Better Future Nov. 7-9, 2023 - Hilton Haikou Meilan, Haikou, China Dr. Mars is a Keynote Speaker at the IEC WINNING ON DURABILITY **GET BIG JOBS DONE FAST** <u>Endurica</u> Characterizing Elastomer **Fatigue Behavior for Analysis and Engineering** Live, Online: October 30 - November 3, 2023 | 3 hrs/day + Office Hours Last chance for this workshop in 2023 WELCOME TO FATIGUE 2022<sup>11</sup> 13th International Fatigue Congress November 6-10, 2023 International Conference Center - Hiroshima, Japan **Application of Rubber Fatigue Analysis** with Endurica **Software** Live, Online: December 5-8, 2023 | 3 hrs/day + Office Hours Last chance for this workshop in 2023

Interview by Dr. Will Mars

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Rubbernecking is an interesting thing that makes us look

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