

Interview with

# Hakan AĞIRKAYA

CEO  
T-Rupt



**XPRIMM: Could you briefly introduce T Rupt Technology and its mission?**

**Hakan AĞIRKAYA:** T Rupt was founded as a carve out of Türk Reasürans, bringing together a 40 member multidisciplinary team with expertise in software development, IT & Infrastructure operations in (re)insurance field, and NatCat modeling with a current focus of earthquake loss modeling. Our mission is to build solutions at the intersection of risk, resilience, and innovation. We focus on two strategic platforms: ARU, which streamlines reinsurance operations, and CatMod, our catastrophe loss modeling platform. Both are designed to enhance transparency, efficiency, and data driven decision making across the industry.

# Prof. Dr. Sinan AKKAR

Principal Modeller  
T-Rupt



**XPRIMM: What makes CatMod unique compared to other catastrophe models?**

**Hakan AĞIRKAYA:** CatMod is rooted in academic research but evolved to meet business needs. It integrates detailed stochastic earthquake catalogues, advanced financial modules, and transparent outputs that insurers can directly use for underwriting and portfolio management. The Türkiye earthquake loss model executed by CatMod is calibrated with actual policy loss data from earthquakes that occurred in Türkiye, ensuring accuracy and relevance. For example, after the 2023 Kahramanmaraş earthquakes, our Post Cat Analysis achieved quite realistic loss estimates within days, helping TCIP (Turkish Catastrophe Insurance Pool) to stabilize operations and accelerate regional recovery.

**Prof. AKKAR:** CatMod's dynamic structure provides tailor-made solutions according to the needs of our customers. Respecting the theoretical aspects of probabilistic loss analysis, we can report the losses in different breakdowns: either geographically or financially. The enhanced vulnerability library embedded in CatMod can deliver loss results for a wide range of risk types that exist in the commercial, industrial and engineering exposures of insurance portfolios. CatMod runs the seismic hazard, the main ingredient triggering financial loss, through advanced seismic source and ground motion models at the location of the risk by considering the specific soil conditions at the site of interest. Our modeling team continuously updates the hazard and vulnerability models executed by CatMod at the target regions of interest to T Rupt by putting forward the transparency and originality of each model. As a matter of fact, we do not want to develop "black box" models and are keen to explain every component in our custom-made models due to our ethical responsibility to our clients. In this aspect, we have positive feedback from our local and global partners such as AXA – GRM, PADROM (Romania) and Compulsory Insurance Bureau and Central Bank of Azerbaijan.

**XPRIMM: How has T-Rupt expanded internationally?**

**Hakan AĞIRKAYA:** Our first deployments outside Türkiye began in 2023 with the Romanian scenario-based earthquake model developed for PADROM. The third territory where we advanced earthquake model studies is Azerbaijan, in collaboration with the Central Bank and the Compulsory Insurance Bureau. Since then, CatMod has been adopted by insurers globally, with applications ranging from stochastic modeling and stress testing to site specific analyses. We are now progressing toward licensing readiness, aiming to establish CatMod as a core tool for catastrophe exposed markets worldwide.

**XPRIMM: What role does CatMod play in regulatory compliance and market practice?**

**Prof. AKKAR:** CatMod can run both scenario-based and stochastic earthquake catalog-based probabilistic loss analyses. To this end, one of the most used services of CatMod by the insurance companies in the Turkish market is related to the SEDDK (regulatory) circular 2024/22 that enforces the insurance companies to assess their financial risks for their non-life engineering and property portfolios against the expected catastrophic earthquake in the Marmara Sea. (Referred to as "stress test analysis" in the Turkish insurance sector). The financial loss results provided by CatMod give an enhanced picture to insurance companies regarding the net pre-cat and net post-cat losses from the four different catastrophic Marmara Sea earthquake scenarios modeled by our earthquake engineering group. The modeling team members not only report the loss results to our customers who collaborate with us under the circular 2024/22 but also explain the modeling details of each reported outcome by setting special meeting sessions with each

client. Besides, we provide stochastic loss results to our clients to design their annual reinsurance programs in accordance with the provisions dictated in regulator's circular 2010/2.

**XPRIMM: Could you share some success stories where CatMod made a difference?**

**Prof. AKKAR:** In my point of view, the realistic loss estimate of TCIP portfolio after the 2023 Kahramanmaraş earthquakes marks the beginning of CatMod's success story. The post-event report that relied on CatMod's loss estimates of the devastating Kahramanmaraş duplets helped TCIP and Turk Reasürans management in their meetings with the lead reinsurers as well as the Turkish state. A similar successful event-response report was also released in 2024 that reported the TCIP losses triggered by the Malatya-Kale earthquake. The main underlying reason for computing such realistic loss results stem from the immediate action of our modeling team who develop the digital twin of these events to represent physically justifiable ground-motion fields inflicting the losses. As a matter of fact, T Rupt's modeling team releases informative reports following important earthquakes near densely populated, high-risk urban areas. Accordingly, the team published event response and earthquake informative reports for the April 23, 2025 (M6.2) and August 10, 2025 Sındırgı-Balıkesir (M6.1) earthquakes to brief the insurance community on their potential impact. Besides, the Marmara Sea earthquake scenarios used to comply with the provisional requirements of Circular 2024/22 by SEDDK seem to be well accepted by the non-life insurance sector in Türkiye. I can also nominate these models as the biproducts of a successful project. The other success story would be the completion of Azerbaijan Earthquake Loss Model that is now being executed regularly by the Compulsory Insurance Bureau in Azerbaijan to assess the portfolio risk of local insurance companies operating in Azerbaijan. The Azerbaijanian companies also have great interest in CatMod's stochastic loss results, and that's why we visit them every year to explain and discuss our findings.

**XPRIMM: Beyond earthquakes, what are T-Rupt's future modeling priorities?**

**Hakan AĞIRKAYA:** We are diversifying into flood modeling, recognizing it as Türkiye's second most destructive peril. The Flood Hazard Model project, launched in 2026, is advancing toward completion in second half of 2027. This expansion reflects our commitment to providing comprehensive NATCAT solutions that address multiple perils and support insurers in designing resilient programs.

**XPRIMM: How do you see the future of catastrophe modeling evolving?**

**Prof. AKKAR:** Firstly, multi-hazard catastrophe modeling will start taking over the single-peril models. Just consider the last five years in Türkiye in terms of catastrophic events: one would



immediately count several serious floods, aside from the severe earthquakes, inflicting considerable content damage in the highly populated cities in Türkiye such as İstanbul, Ankara, Adana and Antalya. Flood hazard and, hence the inflicted loss, can amplify the short return periods of loss exceedance probability curves, that in turn, would affect the premiums of non-life property policies. To this connection, at T Rupt, we have already started to work on the flood loss model of Türkiye, which will hopefully be on stage by the end of 2027 to run multi-hazard losses by CatMod. Secondly, the positive interference of AI for enhancements in poorly detailed exposures would certainly improve the reliability and justification of loss calculations. The studies regarding the more active AI involvement in loss analysis are advancing very rapidly and as T Rupt we cannot overlook this reality. Soon our young modelers will start using and developing AI-based tools for betterments in our loss calculations. Currently, these two topics are of our focus point in T Rupt as part of NatCat modeling activities.

**XPRIMM: How does T-Rupt collaborate with other reinsurers, brokers, and modeling vendors, and what differentiates your approach from peers?**

**Hakan AĞIRKAYA:** We see collaboration as essential. T Rupt works closely with reinsurers, brokers, and modeling vendors to ensure our solutions are practical, interoperable, and responsive to market needs. What differentiates us is our agility - we can

deliver post event analyses within days, providing insurers and brokers with actionable insights when they need them most.

As a country specific modeling company, we are open to collaborating with all stakeholders in the ecosystem - reinsurers, brokers, and vendors alike. Through direct partnerships and our engagement with Oasis LMF, we aim to achieve our mission of making CatMod a trusted, interoperable tool that strengthens resilience across catastrophe exposed markets.

**XPRIMM: What is T-Rupt's vision for the next five years?**

**Hakan AĞIRKAYA:** Our vision is to establish CatMod as a licensed, globally recognized platform, while continuing to innovate at the intersection of academia and industry. We aim to deepen collaborations with brokers, regulators, and insurers, ensuring our tools not only meet technical standards but also drive better risk management practices. By 2030, we see T Rupt positioned as a trusted partner for both conventional and parametric reinsurance solutions. (D.G.)