

# New software program that can analyze the quality of petroleum in minutes

April 29 2015, by Kathleen Haughney

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Researchers at Florida State University's Future Fuels Institute have developed a highly sophisticated software program that can analyze the quality of petroleum in mere minutes, allowing petroleum companies and governments better insight into how crude oil can be used, but also potentially how to more effectively clean it up in hazardous situations.

Researchers at the Future Fuels Institute have long been able to use a practice called mass spectrometry, which allows them to essentially weigh molecules of [crude oil](#) and determine their [chemical composition](#). But, in the outside world, scientists are not weighing one molecule of fuel at a time, but hundreds or thousands at a time.

And all of that information needs to be analyzed.

That's where the software comes into the picture.

To deal with the large data sets, FSU Research Faculty Yuri Corilo developed novel software that could analyze the information and spit out results and visualizations of the data so that companies could make informed decisions about how to use the [oil](#) in their possession.

"It will point you to the differences in the data—or petroleum—and what you will need to look at to make decisions about how to best use the oil," Corilo said.

The composition of petroleum varies extremely from one reservoir to

another. By using mass spectrometry, scientists can weigh molecules of oil and determine their chemical composition almost immediately.

"To use a simple analogy, if you built a Lego character and used different blocks to build it—in our case, carbon, hydrogen, nitrogen, oxygen, sulfur—we could weigh it and tell you what the different blocks were and the number of each used in the character," said Ryan Rodgers, director of the institute. "For molecules, it's not much different. We weigh tens-of-thousands of molecules at a time, and determine the number of carbon, hydrogen, nitrogen, oxygen, and sulfur in each."

But, eventually, further analysis is needed to separate one type of oil from another.

As the oil is being analyzed, the data can be entered into the software. The software would then provide detailed reports and visualizations about differences in the oil composition. That can then be used to tell a company how well a certain type of crude oil would perform in a refinery and whether it should be turned into diesel, jet fuel or gasoline.

"Companies need to know this information to intelligently run their refineries," Rodgers said.

The software, PetroOrg, has been exclusively licensed to a local Tallahassee company, Omics LLC, and is currently used by one of the largest [mass spectrometry](#) companies in the world.

But [oil companies](#) are not the only ones who can benefit from PetroOrg software.

It can also analyze biofuels and can help governments deal with hazardous environmental issues, as demonstrated in a recent study by Corilo where the [software](#) was critical in identifying the source of a

major oil spill.

Provided by Florida State University

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