Why a simulated hurricane might be thought of as a real hurricane

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Many air disturbances around the globe end up being called "hurricanes." But what is meant by the term? The common term suggests that there is something all of these storms have in common, and something that is lacked by other kinds of storms. These particular storms arise in different places, of course, and at different times. But they all have a certain structure, and a certain relative strength: there is a low-pressure column of air, surrounded by a number of storm clouds that produce unusually stormy winds and heavy rain. Whenever and wherever we see that structure, we call it a "hurricane."

Now could that same structure arise in very different circumstances, with very different materials? Could a storm on Jupiter or even on the sun be a hurricane? Presumably the answer is yes, since Earth's atmosphere and water are not essential to the structure of a hurricane. The hurricane structure has more to do with how fast materials are swooshing about, and in what sort of pattern.

Could the hurricane pattern also arise on different kinds of scales? Could a galaxy be a hurricane, and could we find a hurricane in a teapot? Again, the answer is presumably yes, if we are willing to think of a hurricane essentially as a pattern of movement and structure, since that pattern could be found on scales large and small.

Finally, could a hurricane be found within the software of a computer program? Here we are not thinking of electrons swirling around in a hurricane pattern. We are thinking of a software program that *somehow* models or simulates the behavior of a hurricane. It seems this could not be accomplished without the pattern of a hurricane being encoded in the program *in some way or another*. Without that pattern somehow being in the program, the program would not be simulating a hurricane, but something else. So the right structure would be there. So, we should conclude, a hurricane would be there.

At first I wonder if this stretches the meaning of the term too far. With changes in materials (Jupiter, Sun), and scale (galaxy, teapot), there still is matter in some kind of violent motion. There is no matter in violent motion in a computer simulation, and that makes it seem as if there is no genuine hurricane present. But then I can imagine someone reminding me that the matter is also simulated in the program, and the violent motion is also simulated, so there is some sense in which the matter in violent motion is present after all. It's as if the hurricane is happening in another dimension of reality: the dimension included in our time and space, but in a virtual time and virtual space.