Aurora

This piece explores the idea of musical creation as a middle ground between two extremes: freedom of action and deterministic systems. It was born by reflecting during a period of feeling constrained by natural forces beyond my control and trying to carve enough wiggle room. The most obvious example is the COVID-19 pandemic. But the idea behind the title was born after trying to watch the Aurora Borealis during a period of intense geomagnetic storms, and how this led to having to make choices (from driving to locations to whether or not to even stay up to watch for it) based on the current state of astronomical phenomena.

Auroras are caused by disturbances in Earth’s magnetic field caused by streams of charged particles released by the sun. When a geomagnetic storm releases a big enough number of them, they interact with Earth’s magnetic poles creating a visual display of colors (with some sound component to them, according to some sources) in high-latitude regions.

The area where Auroras are visible is expanded during events such as coronal mass ejections, and the simplest way to determine the probability of watching them at a specific latitude is to monitor the K-index. This index is determined by averaging several readings of fluctuations in the magnetosphere taken at 3-hour intervals around the globe It is measured from 0 to 9 with three intervals in between each digit, amounting to 28 different possible levels.

The piece involves a score and a piece of software that functions as a conductor. The score consists of 6 sections, with the first one being through-composed and the rest consisting on two columns (A and B) with diverse musical material and instructions. Some sections have material that is more determinate, like specific rhythmic patterns, while others just suggest via graphical notation musical gestures to be performed. Most give at least a couple of choices of material to be played and connects them via edges in a flowchart manner, giving enough freedom to the performer in the way they want to structure each section.

The software looks online for the latest K-index and uses it to determine the length of the whole piece and each of the 6 sections, the higher the index the shorter the piece. More magnetic activity leads to a greater change of rate between different material. A graphical interface displays a counter with the time remaining for each section. This is only intended to give a general idea of the location within the whole piece, and performers are encouraged to switch sections independently and even some time before or after the counter reaches 0. The use of Independent, asymmetrical, and even fluid tempos is encouraged, synchronization shouldn’t be pursued.

From section 2 on, the software also uses the aforementioned index to make a weighted choice for each instrument between the “A” and “B” columns and displays the result. Using spectromorphological definitions, the piece can fluctuate between being predominantly textural or gestural, depending on low and high K-index values respectively. Musical material found in “B” columns tend to have more active and rhythmic characteristics, while those found in “A” tend to be more continuous and textural.