Daniel Topa <daniel.topa@ertcorp.com>

RCS array

6 messages

Daniel Topa <daniel.topa@ertcorp.com> Mon, Mar 16, 2020 at 1:41 PM
To: Eric Lahti <eric.lahti@ertcorp.com>, Matthew Lietz <matthew.lietz@ertcorp.com>, Christopher McGeorge <christopher.mcgeorge@ertcorp.com>

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Gentlemen:

The MoM RCS data is delivered in a matrix with m rows and n columns (standard matrix
addressing).

1 <= m <= 28 MHz (integer steps)
1 <= n <= 181 degrees (integer steps)

The matrix is WIDE (more columns than rows)

Frequency partition:
row 1: 3 MHz
row 2: 4 MHz
 .  .  .  .
row 28: 30 Mhz

Let r index the rows. Then frequency nu is in row = nu -2

Angular partition
col 1: 0  col 2: 1 ... col 181: 180

col 1   col 2   col 3       col 181
  0       1       2    ...    180

Let c be the column index. The measurement for angle alpha is in column c = alpha + 1

The test asset is symmetric: sigma(alpha) = sigma(-alpha)

But the matrix can easily be delivered in other forms, such as the transpose
(interchange rows and columns), or packed into a linear array.

Sample:

4.16411, 4.14247, 4.07319, 3.95637, 3.79263, 3.58287, 3.32827, 3.0303, ...
18.2776, 18.2369, 18.1199, 17.9248, 17.6523, 17.3041, 16.8817, 16.3876, ...
25.6306, 25.5886, 25.463, 25.2538, 24.9618, 24.5882, 24.1346, 23.6028, ...
...


Dan

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Eric Lahti <eric.lahti@ertcorp.com> Mon, Mar 16, 2020 at 1:53 PM
To: Daniel Topa <daniel.topa@ertcorp.com>
Cc: Matthew Lietz <matthew.lietz@ertcorp.com>, Christopher McGeorge <christopher.mcgeorge@ertcorp.com>

Guys,

I'm kind of spitballing here, but I'm guessing we're going to need any kind of JavaScript readable array. A JSON file would work nicely if we can do that. No matter how wide it is, as long as we can represent frequency and angle in some kind of queryable format we should be okay. One thing we should probably think about is the end product. I can't say for certain, but it seems likely we'd be adding this data either to the existing cross section part of the dashboard or replacing the information that's already in there, so it seems likely that we'd want some basic information about a target along with the cross section matrix. Something like target name should be sufficient: F19 Frisbee or something like that. If you send me some data, I'll see if I can make a JSON sample file.

Eric

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Daniel Topa <daniel.topa@ertcorp.com> Mon, Mar 16, 2020 at 4:20 PM
To: Eric Lahti <eric.lahti@ertcorp.com>

Eric:

Good catch. The JSON will have all the relevant target information.

Also, we will probably want to keep generic targets with constant RCS. I can create series of generic assets in order to maintain the capability that we have now.

Dan
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Daniel Topa <daniel.topa@ertcorp.com> Mon, Mar 16, 2020 at 4:25 PM
To: Eric Lahti <eric.lahti@ertcorp.com>
Cc: Matthew Lietz <matthew.lietz@ertcorp.com>, Christopher McGeorge <christopher.mcgeorge@ertcorp.com>

Eric:

Feel free to use the data from the first e-mail. A 2 x 2 array format should

be sufficient for me to create the whole array. The conversion to JSON seems simple and added different data fields won't present any trouble.

The entries in each position are radar cross sections and have the dimensions of area and are nonnegative real numbers.

Dan

On Mon, Mar 16, 2020 at 1:53 PM Eric Lahti <eric.lahti@ertcorp.com> wrote:
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Eric Lahti <eric.lahti@ertcorp.com> Mon, Mar 16, 2020 at 5:18 PM
To: Daniel Topa <daniel.topa@ertcorp.com>
Cc: Matthew Lietz <matthew.lietz@ertcorp.com>, Christopher McGeorge <christopher.mcgeorge@ertcorp.com>

Okey dokey. I'll see if I can work something up in the morning.

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Eric Lahti <eric.lahti@ertcorp.com> Tue, Mar 17, 2020 at 7:12 AM
To: Daniel Topa <daniel.topa@ertcorp.com>
Cc: Matthew Lietz <matthew.lietz@ertcorp.com>, Christopher McGeorge <christopher.mcgeorge@ertcorp.com>

Dan,

Here's something that should work. I modelled this off the existing asset data in the ConfigRegion.xml file each OTHR site uses, so we should be able to fit it into the existing infrastructure fairly easily. Most of the data will be repeated, at least for now. Label would be the name of the asset, ICONImage will probably remain Bald_Eagle-sm.png for aircraft or Shark2-sm.png for maritime assets, description, nominalSpeed, and CIT will remain Aircraft, 400, and 2.0 or Ship, 40, and 25.0. I never discussed it with Nelson, but my gut says all that extra data like nominalSpeed and CIT will probably get customized for each asset at some point in the future. For now, we can probably safely use the existing default values. The only major change from the XML is, of course, the cross section table. While we can visualize it as rows of Mhz and columns of angles or vice versa, it doesn't really matter once it hits JSON since JSON will just represent it all as an array of objects.

Attached is an Excel spreadsheet that I bammed up and the associated JSON data. If you want to see the JSON in something a bit easier to consume, go to http://json2table.com/, paste the JSON code in and hit run.

I'm kind of guessing we'll either eventually see one JSON file per asset or a single file with an array of assets. One file per asset would be easiest to maintain; then we could dynamically add and remove assets based on whether or not an instance of the dashboard has the necessary JSON file.

Matt, does this look like something you could use?

Eric
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2 attachments

Bonito5000.xlsx
10K

Bonito5000.json
1K