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INVOICE

Recipient

Electro Magnetic Applications Inc.	143 Union Blvd #900, Lakewood, CO, 80228, United States of America	Timothy McDonald tim@ema3d.com

Electronic payment information Wells Fargo - Account number 8094382838 - Routing number 102000076

Invoice Number	Date	Payment Due	Project Name
AAA202412200	December 20, 2024	December 30, 2024	Charge Plus Optimization

ITEM	TIME [min]	RATE [$/minute]	SUBTOTAL
November			
EMA3D-1894			
Meeting on Xdmf and HDF5 formats for parallel output of CHARGE+ results.	60	5	$300.00
EMA3D-1894			
Provided proposal for Xdmf3 and HDF5 files in order to read Charge's solutions while it is still running on JIRA. Explained in detail in JIRA comments.	120	5	$600.00
December			
EMA3DFEM-50			
Communication with Dustin Ursey on the possible paths for HDF5 output. Investigating SWMR capacities and write an example of C++ generating HDF5 files and Python reading those files during C++ writing process. C++ and Python experiments were logged in a comment, work was logged in **EMA3D-1894**.	240	5	$1,200.00
EMA3DFEM-50			
Communication via Teams with Bryon and Dustin to define details of the way Charge+ stores information and how to translate that to HDF5. Work was logged in **EMA3D-1894**.	120	5	$600.00
EMA3DFEM-50			
HDF5 SWMR parallel files work. Communication via Teams with Eric Miller to inquire of possible specifications from the UI side. Clarifications to Dustin on the parallel model currently in Charge+ and the parallel subdomain capacities via METIS. Clarify the necessity of element-based HDF5 storage and boundary duplication between subdomains. Work was logged in **EMA3D-1894**.	120	5	$600.00
EMA3DFEM-50			
Continued work on HDF5 SWMR parallel files. Further analysis of how the data structures will be included in the HDF5 file. XDMF cannot cope with hyperslab slicing because of lack of maintenance on Kitware's side. Going back to a Paraview plugin. Work was logged in **EMA3D-1894**.	120	5	$600.00
EMA3DFEM-50			
Testing of first version of HDF5 files from Dustin Ursrey. Discovery of incompatibility with HDFView v3.3.1, replace with HDFView 3.3.2 works. Debugging of the way elements are described with help of Bryon Neufeld w.r.t. the #elements/#points ratio. First successful visualization of Charge+'s parallel output achieved via python plugin. SWMR capabilites not tested yet. Troubleshooting Charge+ Linux issue related to licenses reported by Will Isaac, underlying problem was found to be related to the license update done by Keyton Rogers on Dec 20, Keyton is in contact with Will. Work was logged in **EMA3D-1894**.	120	5	$600.00
		Total	$4,500.00