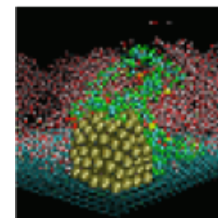
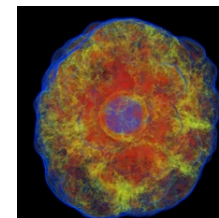
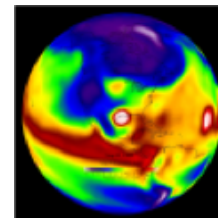
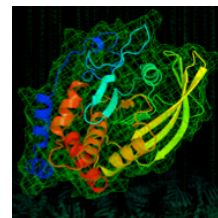
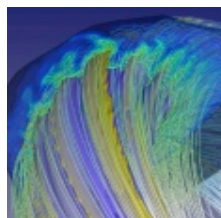
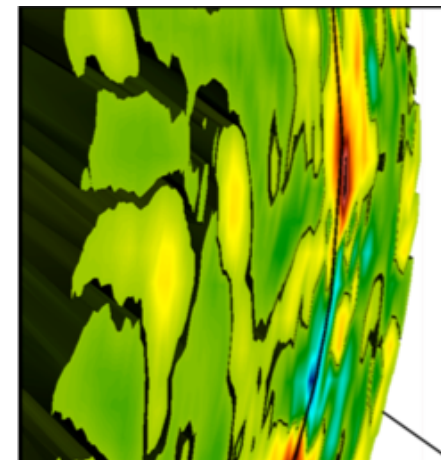


Intel Advisor on Cori



Charlene Yang

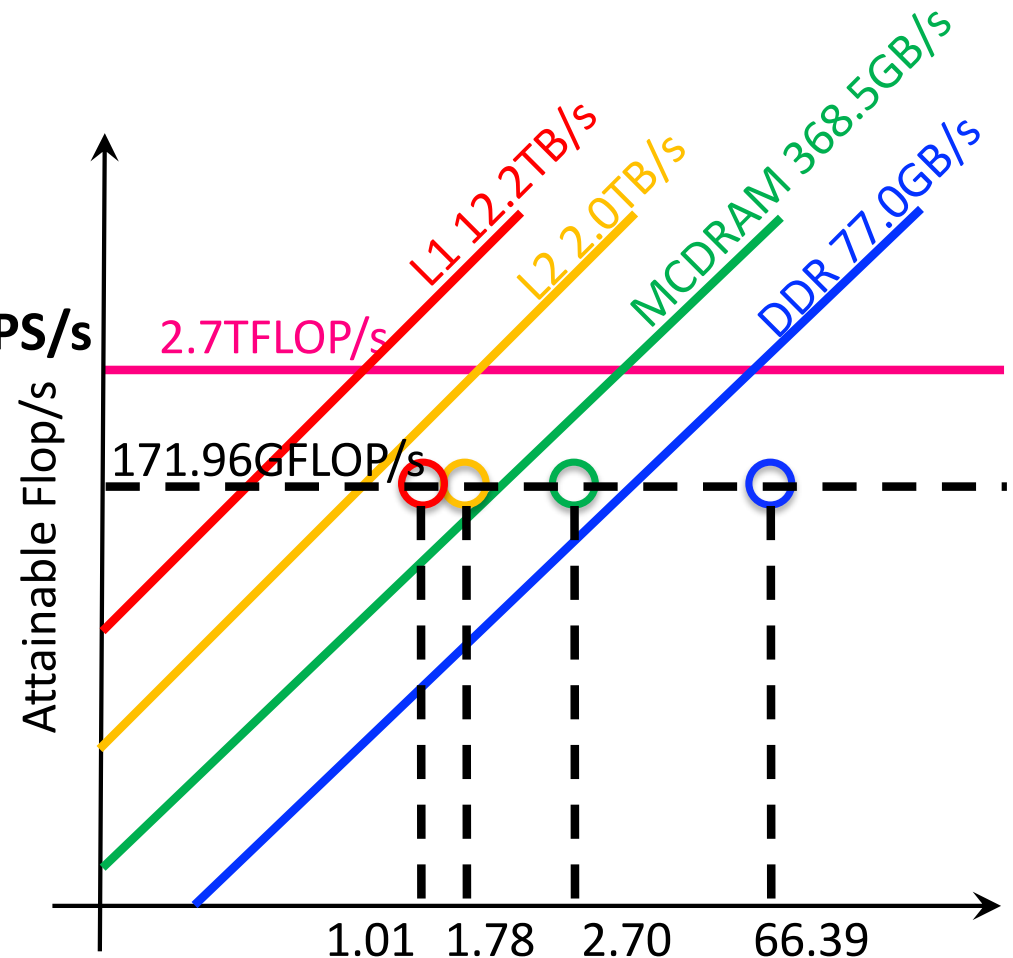
Application Performance Group
cjyang@lbl.gov

Old approach -- pen and paper

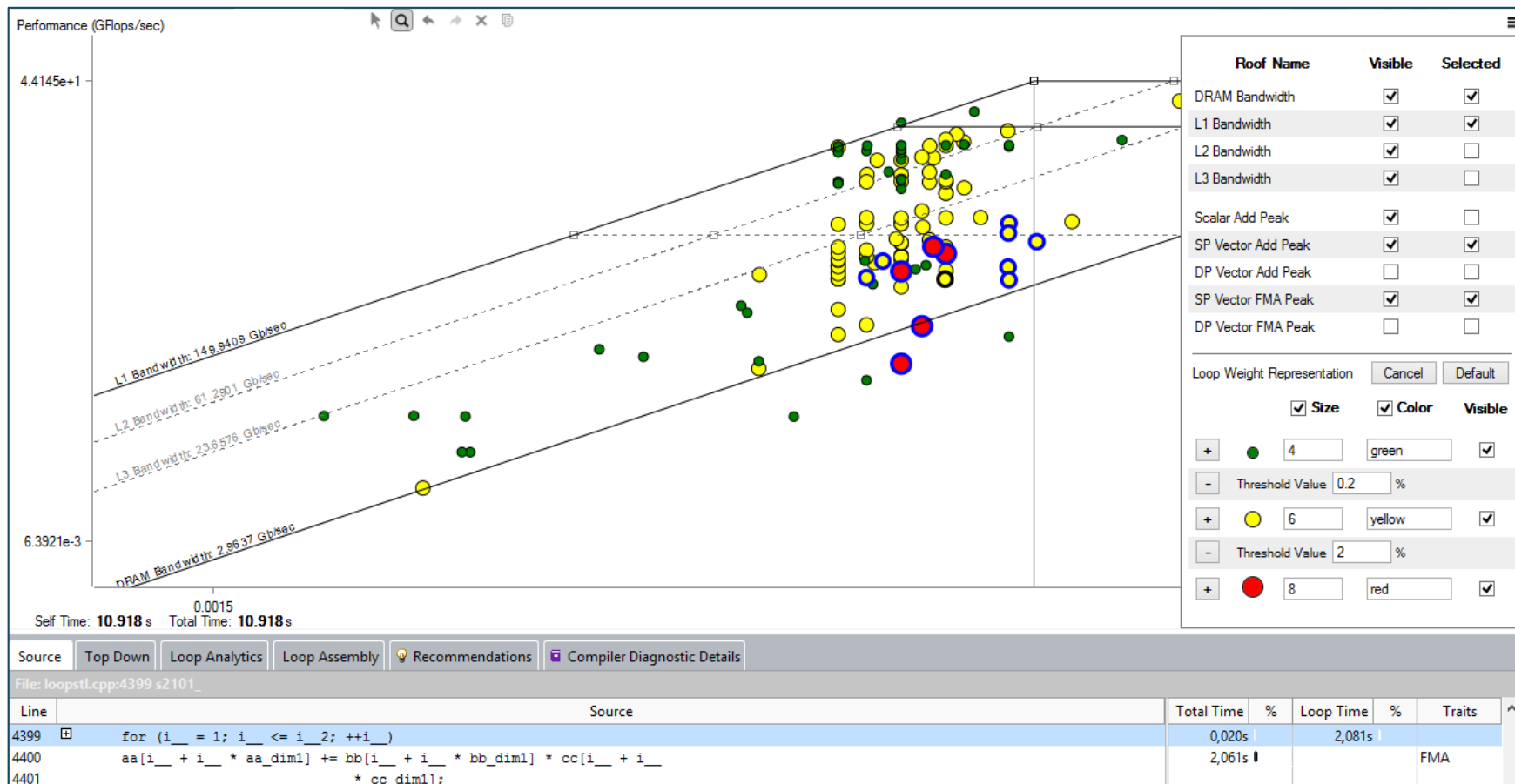


GPP kernel on KNL

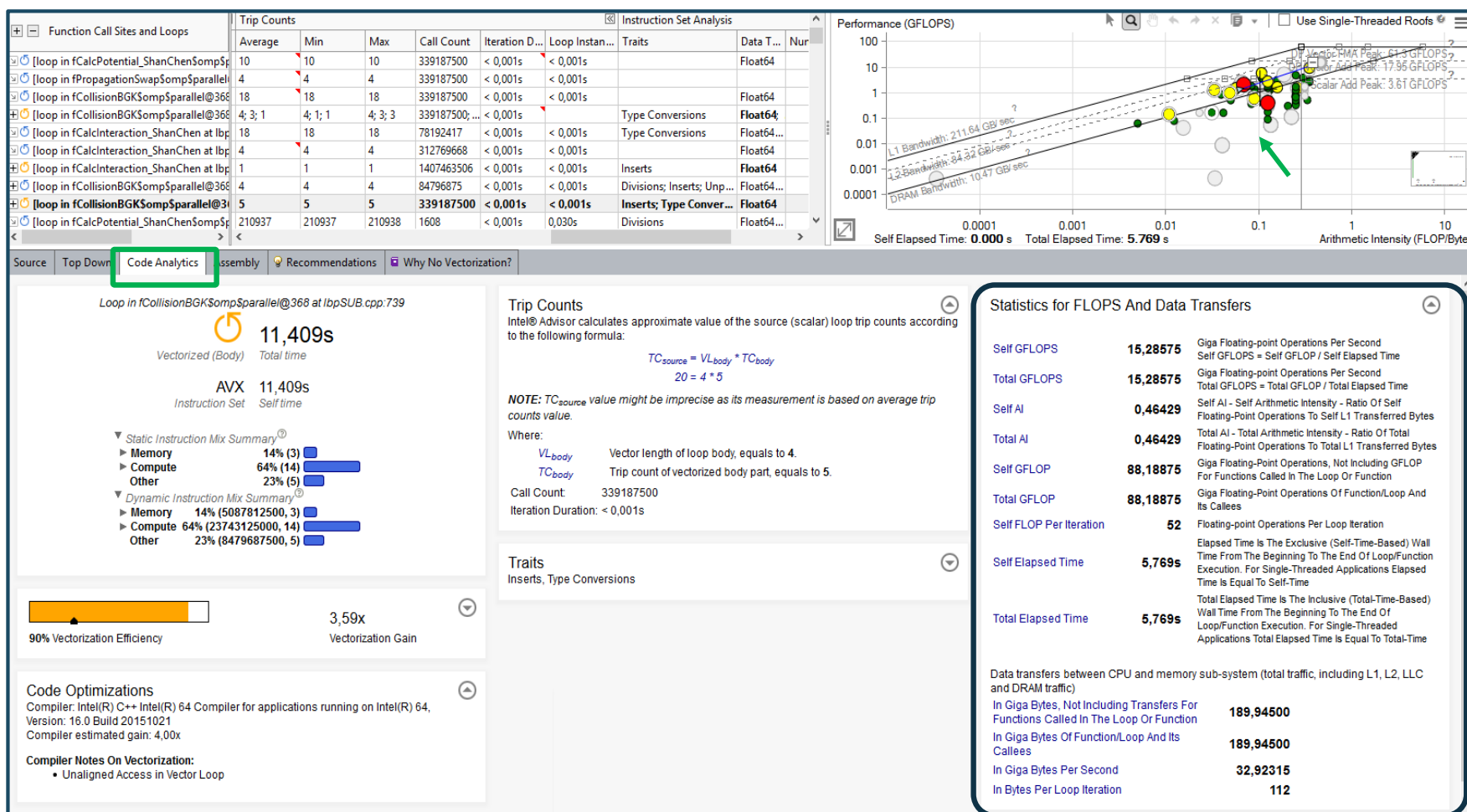
- AI (DRAM): 66.39
- AI (MCDRAM): 2.70
- AI (L2): 1.78
- AI (L1): 1.01
- Performance: 171.960 GFLOPS/s



Intel® Advisor: automatic and refined



Intel® Advisor: code analytics



Intel® Advisor: 2-step data collection



Roofline : Axis X: AI = #FLOP / #Bytes Axis Y: FLOP/S = #FLOP (mask aware) / #Seconds	Overhead
Step 1: Survey (-collect survey) - Provide #Seconds - <i>Root access not needed</i> - User mode sampling, non-intrusive.	1x
Step 2: FLOPS (-collect tripcounts -flops) - Provide #FLOP, #Bytes, AVX-512 Mask - <i>Root access not needed</i> - Precise, instrumentation based, count number of instructions	3-5x

Setup on Cori



- **Compile with -g to get debugging info**

```
cc -g -dynamic -openmp -O2 -o mycode.exe mycode.c
```

- **Cache-Aware Roofline Model (CARM)**

```
module load advisor/2018.up1
```

- **Integrated Roofline Model (Cache Simulator)**

```
module load advisor/2018.integrated_roofline.up1
```

- **Incompatible GUI for regular and integrated Advisor**

Run Advisor on Cori



- **Start an interactive session on a KNL node**

```
salloc --qos=interactive -C knl -N 1 -t hh:mm:ss -A <your_account>
```

- **To collect data for roofline, do two collections: survey and tripcounts.**

```
srun -n <num-of-ranks> -c <num_of_cores_per_rank> advixe-cl -v  
-collect survey -no-auto-finalize -project-dir=<same_dir_name>  
-data-limit=0 -- <your_executable>
```

```
srun -n <num-of-ranks> -c <num_of_cores_per_rank> advixe-cl -v  
-collect tripcounts -flops -no-auto-finalize -project-dir=<same_dir_name> -  
data-limit=0 -- <your_executable>
```

- **Run on the Lustre filesystem \$SCRATCH**
- **Finalization is expensive especially on KNL: do it offline!**

Pack/View results



- **Pack results/source file/binary (already packed in demo)**

```
advixe-cl --snapshot --project-dir <same_dir_name> --pack --cache-sources  
--cache-binaries -- <target_file_name>
```

- **Load module**

```
module load advisor/2018.integrated_roofline.up1  
module show advisor/2018.integrated_roofline.up1
```

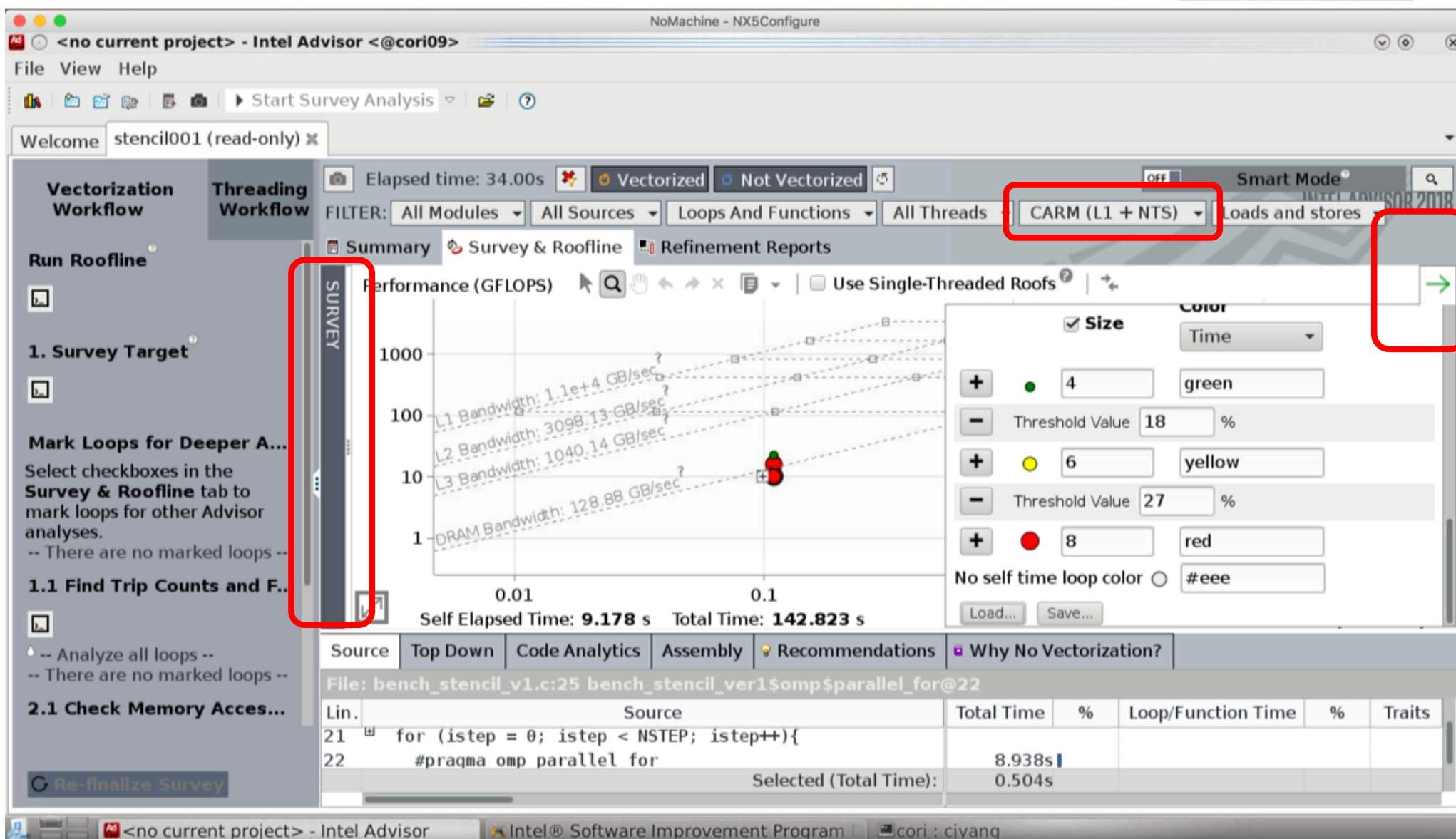
```
setenv ADVISOR_XE_2018_DIR  
/global/common7/cori/software/intel/advisor_2018.0.2.537542
```

- **Copy file and view results**

```
cp -r $ADVISOR_XE_2018_DIR/ECP-meeting-tutorial/ .  
cd ECP-meeting-tutorial/
```

```
advixe-gui stencil.advixeexpz
```

- or use NX: <https://nxcloud01.nersc.gov>
- ssh -Y username@cori.nersc.gov



NeRSC