

HARNESS cuda IMPLEMENTS spmv_csr

```
double alpha = 1.0;
double beta  = 0.0;
cusparsMatDescr_t descrA;
cusparsCreateMatDescr(&descrA);
cusparsDcsmv(handle,
              CUSPARSE_OPERATION_NON_TRANSPOSE,
              rows, cols, ranges[rows], &alpha,
              descrA, d_mat, d_ranges, d_indir,
              d_vec, &beta, d_out);
```

Marshalling

```
int      cols = Maximum of indir[0..ranges[rows]]
double*  d_mat = CudaRead of matrix[0..ranges[rows]]
double*  d_vec = CudaRead of vector[0..cols]
int*     d_ranges = CudaRead of ranges[0..rows+1]
Int*     d_indir = CudaRead of indir[0..rowstr[rows]]
double*  d_out = CudaWrite of output[0..rows]
```

PersistentVariables

```
cusparsHandle_t handle
```

BeforeFirstExecution

```
cusparsCreate(&handle);
```

AfterLastExecution

```
cusparsDestroy(handle);
```

CppHeaderFiles

```
<cuda_runtime.h> "cuspars_v2.h"
```