

```
In [1]: using Distributed
ENV["JULIA_REVISE_POLL"] = 1 # only on cluster
addprocs(40)
```

```
Out[1]: 40-element Vector{Int64}:
 2
 3
 4
 5
 6
 7
 8
 9
10
11
12
13
14
 ⋮
30
31
32
33
34
35
36
37
38
39
40
41
```

```
In [2]: using Revise
using ChainRules
using Zygote
using BenchmarkTools
```

```
└─ Info: Precompiling ChainRules [082447d4-558c-5d27-93f4-14fc19e9eca2]
└─ @ Base loading.jl:1317
└─ Info: Precompiling Zygote [e88e6eb3-aa80-5325-afca-941959d7151f]
└─ @ Base loading.jl:1317
```

Simple Benchmark (in the new rule, pullback for `wide_func` is never communicated between processors)

```
In [3]: wide_func = (x) -> begin
        arr = [x for i in 1:1000]
        sum(arr)
      end

        f(arr) = sum(pmap(wide_func, arr))
```

```
Out[3]: f (generic function with 1 method)
```

```
In [4]: # primal
```

```
@btime f(1:40)
```

```
Out[4]: 1.897 ms (2489 allocations: 113.50 KiB)
820000
```

```
In [6]: # old ChainRules + Zygote
```

```
@btime gradient(f, 1:40)
```

```
Out[6]: 198.883 ms (1214730 allocations: 49.10 MiB)
([1000.0, 1000.0, 1000.0, 1000.0, 1000.0, 1000.0, 1000.0, 1000.0, 1000.0, 1000.0
... 1000.0, 1000.0, 1000.0, 1000.0, 1000.0, 1000.0, 1000.0, 1000.0, 1000.0, 1000.
0],)
```

```
In [10]: # new ChainRules + Zygote
```

```
@btime gradient(f, 1:40)
```

```
Out[10]: 10.508 ms (11405 allocations: 608.25 KiB)
([1000.0, 1000.0, 1000.0, 1000.0, 1000.0, 1000.0, 1000.0, 1000.0, 1000.0, 1000.0
... 1000.0, 1000.0, 1000.0, 1000.0, 1000.0, 1000.0, 1000.0, 1000.0, 1000.0, 1000.
0],)
```