Optimisation :

Barycentre

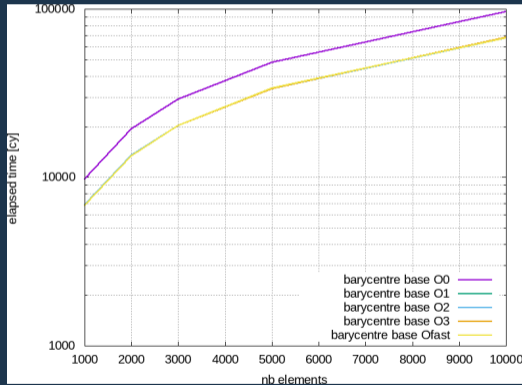**Pierre Aubert**

$$(g_x, g_y) = \frac{1}{N} \sum_{i=1}^{N} (x_i, y_i) \cdot a_i$$
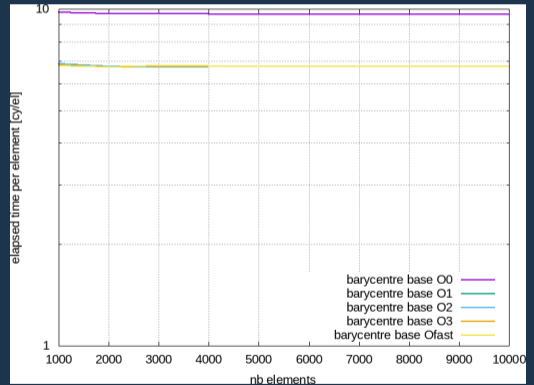

g_x ▣/nbElement g_y ▣/nbElement

```
void barycentre(float & gx, float & gy, const float * tabX, const float* tabY, const float* tabA, long unsigned int nbElement){
        gx = 0.0f;
        gy = 0.0f;
        for(long unsigned int i(0lu); i < nbElement; ++i){
                gx += tabX[i]*tabA[i];
                gy += tabY[i]*tabA[i];
        }
        gx /= (float)nbElement;
        gy /= (float)nbElement;
}
```

Total Elapsed Time (cy)
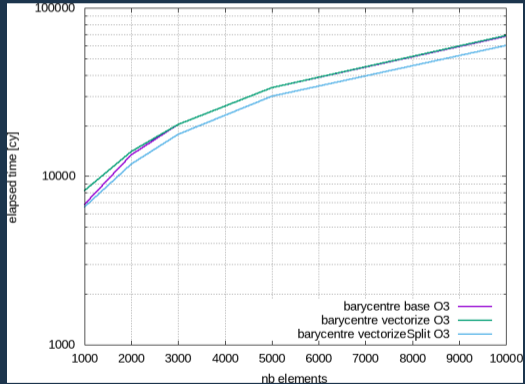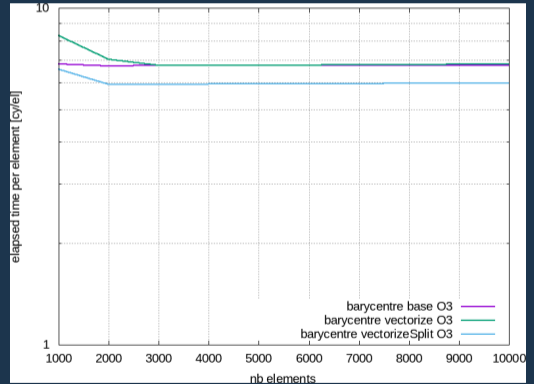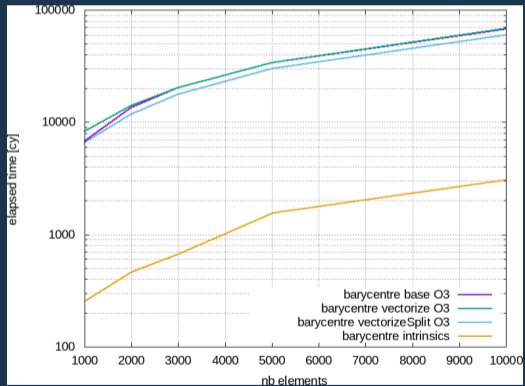
Elapsed Time per element (cy/el)
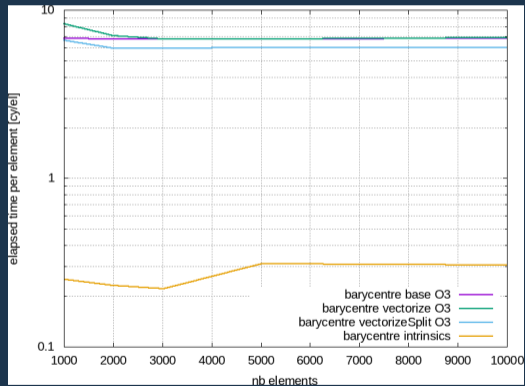
Total Elapsed Time (cy)

Elapsed Time per element (cy/el)
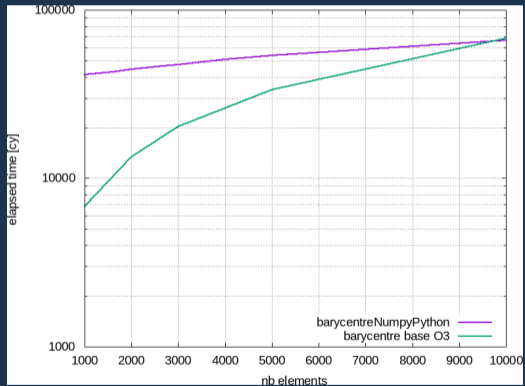
Total Elapsed Time (cy)
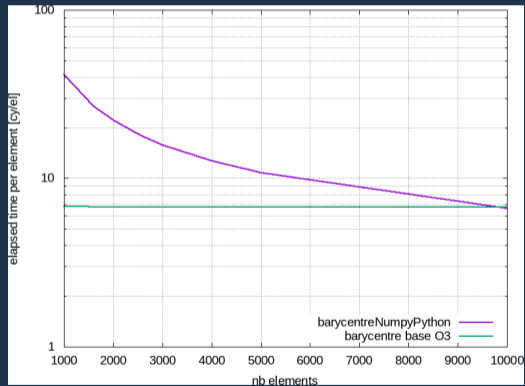
Elapsed Time per element (cy/el)

2000 elements, Intrinsics is **28** times faster than -**Ofast** vectorized
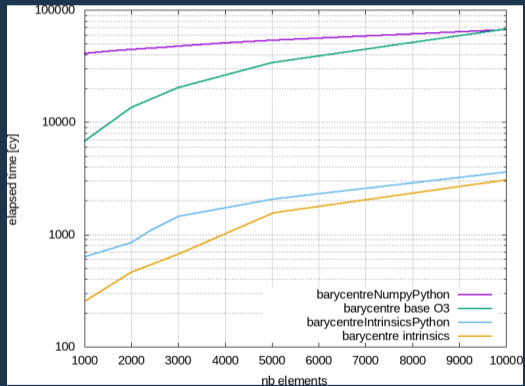
Total Elapsed Time (cy)
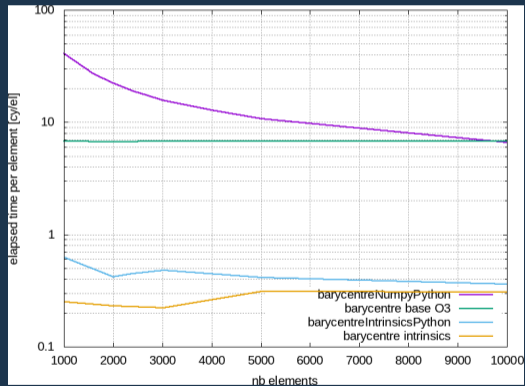
Elapsed Time per element (cy/el)

1000 elements, C++ O3 version is **5.7** times faster than **numpy** version

Total Elapsed Time (cy)

Elapsed Time per element (cy/el)

1000 elements, our python version is **53** times faster than **numpy** version