```cpp
/*
 * adaptive_integration.h
 *
 *  Created on: Sep 16, 2024
 *      Author: Shawn / Alessio
 */

#ifndef ADAPTIVE_INTEGRATION_HPP_
#define ADAPTIVE_INTEGRATION_HPP_

#include <cmath>
#include <stdint.h>
#include <vector>
#include <functional>

using namespace std;

double func_simpsons_rule(const function<double(double)>& func_f, double begin_limit,
double end_limit, double tolerance);
double func_ASI(const function<double(double)>& func_f, double begin_limit, double
end_limit, double tolerance, uint32_t& func_call_counter);

#endif /* ADAPTIVE_INTEGRATION_HPP_ */
```