Manual for easy use of MATLAB files

For the convenient use, each file is written as MATLAB function with detailed comments inside. An example of use: `[answ1,answ2]=sumsin2articleoneinfty(mu,p,nmax)`. This file verifies formula (39), where `answ1` is the result provided by the direct numeric summation, `answ2` is the result provided by the proposed analytic method, `mu`=$\mu \in (0,1)$, `p`=p, `nmax` is the upper bound for the numeric evaluation of the sum (instead of ∞). In practice, `nmax` may be taken in the range 10^3–10^5. Here is an example of the produced result:

```
>> format long
>> [answ1,answ2]=sumsin2articleoneinfty(0.2,1,1e3)
answ1 =
   0.05759857196629
answ2 =
   0.05759857213295
```

Both results, numeric `answ1` and analytic `answ2`, become infinitely close as `nmax`$\to \infty$. One may also verify, with the help of (35), that the corresponding

$$\mathrm{THD}[y(t,0.2,1)] = \sqrt{\frac{2 \times 0.05759857213295}{\sin^2(0.2 \times \pi)}} = 0.57743375956794 = 57.743375956794\%.$$

This result can be found in Tab. I, case $\mu = 0.2$, $p = 1$. Formula (39bis) [first unnumbered formula after the formula (39)] is verified in the same file, last commented line. In the similar way, files `sum300311bis` and `sum300311ter` verify formulæ (53) and (54) respectively. Here is an example with arbitrary values of α and ε:

```
>> [answ1,answ2]=sum300311bis
eps =
   2.45392302251774
alfa =
   4.14833208202896
answ1 =
   3.40716659079914
answ2 =
   3.40716658556960
```

Note that if input parameters α and ε are not given explicitly, programs work with default values (which are randomly chosen to ensure verification in all possible cases). File `sum300313cin` verifies formula (48). Programs `thdrscomputing` and `thdswcomputing` verify respectively formulæ (26ter) [last unnumbered formula in the section III.B-2] and (32) in 3 different ways (exact residue–based method, approximate analytic method and brute numerical summation). These programs are called in the following way:
`[THD_ex,THD_ap,THD_num]=thdrscomputing(Q,nmax)` and
`[THD_ex,THD_ap,THD_num]=thdswcomputing(p,nmax)`. Here are some examples:

```
>> [THD_ex,THD_ap,THD_num]=thdrscomputing(2.63,1e3)
THD_ex =
   0.05071855483864
THD_ap =
```

```
   0.05117813992424
THD_num =
   0.05071855480895
```

This result, THD=5.1% for $Q = 2.63$, can be found in Fig. 3 (top panel).

```
>> [THD_ex,THD_ap,THD_num]=thdswcomputing(1,1e3)
THD_ex =
   0.36948618209520
THD_ap =
   0.40576651836035
THD_num =
   0.36948618119440
```

This result, THD=36.9% for $p = 1$, can be found in Fig. 4 (top panel). Any other point in these figures may be obtained via these programs. Besides, many intermediate formuæ are also verified inside these files, e.g., file `thdswcomputing` also verifies formulæ (33) and (34).

Finally, do not hesitate to contact me should you require any further clarification.

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