Target equation:

$$-ia_1u^{(1,0)}(x,t)+a_{10}u^{(10,0)}(x,t)-ia_{11}u^{(11,0)}(x,t)+a_{12}u^{(12,0)}(x,t)-ia_{13}u^{(13,0)}(x,t)+a_{14}u^{(14,0)}(x,t)-$$
$$ia_{15}u^{(15,0)}(x,t)+a_{16}u^{(16,0)}(x,t)-ia_{17}u^{(17,0)}(x,t)+a_{18}u^{(18,0)}(x,t)-ia_{19}u^{(19,0)}(x,t)+a_2u^{(2,0)}(x,t)+$$
$$a_{20}u^{(20,0)}(x,t)-ia_{21}u^{(21,0)}(x,t)+a_{22}u^{(22,0)}(x,t)-ia_{23}u^{(23,0)}(x,t)+a_{24}u^{(24,0)}(x,t)-ia_{25}u^{(25,0)}(x,t)+$$
$$a_{26}u^{(26,0)}(x,t)-ia_{27}u^{(27,0)}(x,t)+a_{28}u^{(28,0)}(x,t)-ia_{29}u^{(29,0)}(x,t)-ia_3u^{(3,0)}(x,t)+a_{30}u^{(30,0)}(x,t)-$$
$$ia_{31}u^{(31,0)}(x,t)+a_{32}u^{(32,0)}(x,t)-ia_{33}u^{(33,0)}(x,t)+a_{34}u^{(34,0)}(x,t)+a_4u^{(4,0)}(x,t)-ia_5u^{(5,0)}(x,t)+$$
$$a_6u^{(6,0)}(x,t)-ia_7u^{(7,0)}(x,t)+a_8u^{(8,0)}(x,t)-ia_9u^{(9,0)}(x,t)-bu(x,t)\left|u(x,t)\right|^2+iu^{(0,1)}(x,t)=0$$

Substitutions:

$$\mathrm{N}=17$$
$$u(x,t)\to y(z)e^{i(kx-\omega t)}$$
$$z\to x-\mathrm{C0}t$$
$$y(z)\to AR(z)^{17}$$
$$R'(z)^2=R(z)^2\left(1-\chi R(z)^2\right)$$

Imaginary part of equation after substitutions:

$$-278256a_{34}y^{(5)}(z)k^{29}+237336a_{33}y^{(5)}(z)k^{28}+201376a_{32}y^{(5)}(z)k^{27}+5379616a_{34}y^{(7)}(z)k^{27}-169911a_{31}y^{(5)}(z)k^{2}$$
$$4272048a_{33}y^{(7)}(z)k^{26}-142506a_{30}y^{(5)}(z)k^{25}-3365856a_{32}y^{(7)}(z)k^{25}-52451256a_{34}y^{(9)}(z)k^{25}+$$
$$118755a_{29}y^{(5)}(z)k^{24}+2629575a_{31}y^{(7)}(z)k^{24}+38567100a_{33}y^{(9)}(z)k^{24}+98280a_{28}y^{(5)}(z)k^{23}+2035800a_{30}y^{(7)}(z)k^{2}$$
$$28048800a_{32}y^{(9)}(z)k^{23}+286097760a_{34}y^{(11)}(z)k^{23}-80730a_{27}y^{(5)}(z)k^{22}-1560780a_{29}y^{(7)}(z)k^{22}-$$
$$20160075a_{31}y^{(9)}(z)k^{22}-193536720a_{33}y^{(11)}(z)k^{22}-65780a_{26}y^{(5)}(z)k^{21}-1184040a_{28}y^{(7)}(z)k^{21}-$$
$$14307150a_{30}y^{(9)}(z)k^{21}-129024480a_{32}y^{(11)}(z)k^{21}-927983760a_{34}y^{(13)}(z)k^{21}+53130a_{25}y^{(5)}(z)k^{20}+$$
$$888030a_{27}y^{(7)}(z)k^{20}+10015005a_{29}y^{(9)}(z)k^{20}+84672315a_{31}y^{(11)}(z)k^{20}+573166440a_{33}y^{(13)}(z)k^{20}+$$
$$42504a_{24}y^{(5)}(z)k^{19}+657800a_{26}y^{(7)}(z)k^{19}+6906900a_{28}y^{(9)}(z)k^{19}+54627300a_{30}y^{(11)}(z)k^{19}+347373600a_{32}y^{(13)}($$
$$1855967520a_{34}y^{(15)}(z)k^{19}-33649a_{23}y^{(5)}(z)k^{18}-480700a_{25}y^{(7)}(z)k^{18}-4686825a_{27}y^{(9)}(z)k^{18}-$$
$$34597290a_{29}y^{(11)}(z)k^{18}-206253075a_{31}y^{(13)}(z)k^{18}-1037158320a_{33}y^{(15)}(z)k^{18}-26334a_{22}y^{(5)}(z)k^{17}-$$
$$346104a_{24}y^{(7)}(z)k^{17}-3124550a_{26}y^{(9)}(z)k^{17}-21474180a_{28}y^{(11)}(z)k^{17}-119759850a_{30}y^{(13)}(z)k^{17}-$$
$$565722720a_{32}y^{(15)}(z)k^{17}-2333606220a_{34}y^{(17)}(z)k^{17}+20349a_{21}y^{(5)}(z)k^{16}+245157a_{23}y^{(7)}(z)k^{16}+$$
$$2042975a_{25}y^{(9)}(z)k^{16}+13037895a_{27}y^{(11)}(z)k^{16}+67863915a_{29}y^{(13)}(z)k^{16}+300540195a_{31}y^{(15)}(z)k^{16}+$$
$$1166803110a_{33}y^{(17)}(z)k^{16}+15504a_{20}y^{(5)}(z)k^{15}+170544a_{22}y^{(7)}(z)k^{15}+1307504a_{24}y^{(9)}(z)k^{15}+$$
$$7726160a_{26}y^{(11)}(z)k^{15}+37442160a_{28}y^{(13)}(z)k^{15}+155117520a_{30}y^{(15)}(z)k^{15}+565722720a_{32}y^{(17)}(z)k^{15}+$$
$$1855967520a_{34}y^{(19)}(z)k^{15}-11628a_{19}y^{(5)}(z)k^{14}-116280a_{21}y^{(7)}(z)k^{14}-817190a_{23}y^{(9)}(z)k^{14}-$$
$$4457400a_{25}y^{(11)}(z)k^{14}-20058300a_{27}y^{(13)}(z)k^{14}-77558760a_{29}y^{(15)}(z)k^{14}-265182525a_{31}y^{(17)}(z)k^{14}-$$
$$818809200a_{33}y^{(19)}(z)k^{14}-8568a_{18}y^{(5)}(z)k^{13}-77520a_{20}y^{(7)}(z)k^{13}-497420a_{22}y^{(9)}(z)k^{13}-2496144a_{24}y^{(11)}(z)k^{1}$$
$$10400600a_{26}y^{(13)}(z)k^{13}-37442160a_{28}y^{(15)}(z)k^{13}-119759850a_{30}y^{(17)}(z)k^{13}-347373600a_{32}y^{(19)}(z)k^{13}-$$
$$927983760a_{34}y^{(21)}(z)k^{13}+6188a_{17}y^{(5)}(z)k^{12}+50388a_{19}y^{(7)}(z)k^{12}+293930a_{21}y^{(9)}(z)k^{12}+1352078a_{23}y^{(11)}(z)k^{1}$$

$$5200300a_{25}y^{(13)}(z)k^{12}+17383860a_{27}y^{(15)}(z)k^{12}+51895935a_{29}y^{(17)}(z)k^{12}+141120525a_{31}y^{(19)}(z)k^{12}+$$
$$354817320a_{33}y^{(21)}(z)k^{12}+4368a_{16}y^{(5)}(z)k^{11}+31824a_{18}y^{(7)}(z)k^{11}+167960a_{20}y^{(9)}(z)k^{11}+705432a_{22}y^{(11)}(z)k^{11}+$$
$$2496144a_{24}y^{(13)}(z)k^{11}+7726160a_{26}y^{(15)}(z)k^{11}+21474180a_{28}y^{(17)}(z)k^{11}+54627300a_{30}y^{(19)}(z)k^{11}+$$
$$129024480a_{32}y^{(21)}(z)k^{11}+286097760a_{34}y^{(23)}(z)k^{11}-3003a_{15}y^{(5)}(z)k^{10}-19448a_{17}y^{(7)}(z)k^{10}-$$
$$92378a_{19}y^{(9)}(z)k^{10}-352716a_{21}y^{(11)}(z)k^{10}-1144066a_{23}y^{(13)}(z)k^{10}-3268760a_{25}y^{(15)}(z)k^{10}-8436285a_{27}y^{(17)}(z)$$
$$20030010a_{29}y^{(19)}(z)k^{10}-44352165a_{31}y^{(21)}(z)k^{10}-92561040a_{33}y^{(23)}(z)k^{10}-2002a_{14}y^{(5)}(z)k^{9}-$$
$$11440a_{16}y^{(7)}(z)k^{9}-48620a_{18}y^{(9)}(z)k^{9}-167960a_{20}y^{(11)}(z)k^{9}-497420a_{22}y^{(13)}(z)k^{9}-1307504a_{24}y^{(15)}(z)k^{9}-$$
$$3124550a_{26}y^{(17)}(z)k^{9}-6906900a_{28}y^{(19)}(z)k^{9}-14307150a_{30}y^{(21)}(z)k^{9}-28048800a_{32}y^{(23)}(z)k^{9}-$$
$$52451256a_{34}y^{(25)}(z)k^{9}+1287a_{13}y^{(5)}(z)k^{8}+6435a_{15}y^{(7)}(z)k^{8}+24310a_{17}y^{(9)}(z)k^{8}+75582a_{19}y^{(11)}(z)k^{8}+$$
$$203490a_{21}y^{(13)}(z)k^{8}+490314a_{23}y^{(15)}(z)k^{8}+1081575a_{25}y^{(17)}(z)k^{8}+2220075a_{27}y^{(19)}(z)k^{8}+4292145a_{29}y^{(21)}(z)k$$
$$7888725a_{31}y^{(23)}(z)k^{8}+13884156a_{33}y^{(25)}(z)k^{8}+792a_{12}y^{(5)}(z)k^{7}+3432a_{14}y^{(7)}(z)k^{7}+11440a_{16}y^{(9)}(z)k^{7}+$$
$$31824a_{18}y^{(11)}(z)k^{7}+77520a_{20}y^{(13)}(z)k^{7}+170544a_{22}y^{(15)}(z)k^{7}+346104a_{24}y^{(17)}(z)k^{7}+657800a_{26}y^{(19)}(z)k^{7}+$$
$$1184040a_{28}y^{(21)}(z)k^{7}+2035800a_{30}y^{(23)}(z)k^{7}+3365856a_{32}y^{(25)}(z)k^{7}+5379616a_{34}y^{(27)}(z)k^{7}-$$
$$462a_{11}y^{(5)}(z)k^{6}-1716a_{13}y^{(7)}(z)k^{6}-5005a_{15}y^{(9)}(z)k^{6}-12376a_{17}y^{(11)}(z)k^{6}-27132a_{19}y^{(13)}(z)k^{6}-$$
$$54264a_{21}y^{(15)}(z)k^{6}-100947a_{23}y^{(17)}(z)k^{6}-177100a_{25}y^{(19)}(z)k^{6}-296010a_{27}y^{(21)}(z)k^{6}-475020a_{29}y^{(23)}(z)k^{6}-$$
$$736281a_{31}y^{(25)}(z)k^{6}-1107568a_{33}y^{(27)}(z)k^{6}-252a_{10}y^{(5)}(z)k^{5}-792a_{12}y^{(7)}(z)k^{5}-2002a_{14}y^{(9)}(z)k^{5}-$$
$$4368a_{16}y^{(11)}(z)k^{5}-8568a_{18}y^{(13)}(z)k^{5}-15504a_{20}y^{(15)}(z)k^{5}-26334a_{22}y^{(17)}(z)k^{5}-42504a_{24}y^{(19)}(z)k^{5}-$$
$$65780a_{26}y^{(21)}(z)k^{5}-98280a_{28}y^{(23)}(z)k^{5}-142506a_{30}y^{(25)}(z)k^{5}-201376a_{32}y^{(27)}(z)k^{5}-278256a_{34}y^{(29)}(z)k^{5}+$$
$$126a_{9}y^{(5)}(z)k^{4}+330a_{11}y^{(7)}(z)k^{4}+715a_{13}y^{(9)}(z)k^{4}+1365a_{15}y^{(11)}(z)k^{4}+2380a_{17}y^{(13)}(z)k^{4}+$$
$$3876a_{19}y^{(15)}(z)k^{4}+5985a_{21}y^{(17)}(z)k^{4}+8855a_{23}y^{(19)}(z)k^{4}+12650a_{25}y^{(21)}(z)k^{4}+17550a_{27}y^{(23)}(z)k^{4}+$$
$$23751a_{29}y^{(25)}(z)k^{4}+31465a_{31}y^{(27)}(z)k^{4}+40920a_{33}y^{(29)}(z)k^{4}+56a_{8}y^{(5)}(z)k^{3}+120a_{10}y^{(7)}(z)k^{3}+$$
$$220a_{12}y^{(9)}(z)k^{3}+364a_{14}y^{(11)}(z)k^{3}+560a_{16}y^{(13)}(z)k^{3}+816a_{18}y^{(15)}(z)k^{3}+1140a_{20}y^{(17)}(z)k^{3}+$$
$$1540a_{22}y^{(19)}(z)k^{3}+2024a_{24}y^{(21)}(z)k^{3}+2600a_{26}y^{(23)}(z)k^{3}+3276a_{28}y^{(25)}(z)k^{3}+4060a_{30}y^{(27)}(z)k^{3}+$$
$$4960a_{32}y^{(29)}(z)k^{3}+5984a_{34}y^{(31)}(z)k^{3}-21a_{7}y^{(5)}(z)k^{2}-36a_{9}y^{(7)}(z)k^{2}-55a_{11}y^{(9)}(z)k^{2}-78a_{13}y^{(11)}(z)k^{2}-$$
$$105a_{15}y^{(13)}(z)k^{2}-136a_{17}y^{(15)}(z)k^{2}-171a_{19}y^{(17)}(z)k^{2}-210a_{21}y^{(19)}(z)k^{2}-253a_{23}y^{(21)}(z)k^{2}-$$
$$300a_{25}y^{(23)}(z)k^{2}-351a_{27}y^{(25)}(z)k^{2}-406a_{29}y^{(27)}(z)k^{2}-465a_{31}y^{(29)}(z)k^{2}-528a_{33}y^{(31)}(z)k^{2}-$$
$$6a_{6}y^{(5)}(z)k-8a_{8}y^{(7)}(z)k-10a_{10}y^{(9)}(z)k-12a_{12}y^{(11)}(z)k-14a_{14}y^{(13)}(z)k-16a_{16}y^{(15)}(z)k-$$
$$18a_{18}y^{(17)}(z)k-20a_{20}y^{(19)}(z)k-22a_{22}y^{(21)}(z)k-24a_{24}y^{(23)}(z)k-26a_{26}y^{(25)}(z)k-28a_{28}y^{(27)}(z)k-$$
$$30a_{30}y^{(29)}(z)k-32a_{32}y^{(31)}(z)k-34a_{34}y^{(33)}(z)k+(a_1-\mathrm{C0}+k\,(k\,(k\,(4a_4+k\,(5a_5+k\,(k\,(k\,(8a_8+k\,(9a_9+k\,($$
$$(a_3+k\,(k\,(k\,(20a_6+k\,(35a_7+k\,(k\,(k\,(120a_{10}+k\,(165a_{11}+k\,(k\,(k\,(364a_{14}+k\,(455a_{15}+k\,(k\,(k\,(816a_{18}+k$$
$$a_5y^{(5)}(z)+a_7y^{(7)}(z)+a_9y^{(9)}(z)+a_{11}y^{(11)}(z)+a_{13}y^{(13)}(z)+a_{15}y^{(15)}(z)+a_{17}y^{(17)}(z)+a_{19}y^{(19)}(z)+$$
$$a_{21}y^{(21)}(z)+a_{23}y^{(23)}(z)+a_{25}y^{(25)}(z)+a_{27}y^{(27)}(z)+a_{29}y^{(29)}(z)+a_{31}y^{(31)}(z)+a_{33}y^{(33)}(z)=0$$

Real part of equation after substitutions:

$$-46376a_{34}y^{(4)}(z)k^{30}+40920a_{33}y^{(4)}(z)k^{29}+35960a_{32}y^{(4)}(z)k^{28}+1344904a_{34}y^{(6)}(z)k^{28}-31465a_{31}y^{(4)}(z)k^{27}-$$

$$1107568a_{33}y^{(6)}(z)k^{27}-27405a_{30}y^{(4)}(z)k^{26}-906192a_{32}y^{(6)}(z)k^{26}-18156204a_{34}y^{(8)}(z)k^{26}+23751a_{29}y^{(4)}(z)k^{25}+$$
$$736281a_{31}y^{(6)}(z)k^{25}+13884156a_{33}y^{(8)}(z)k^{25}+20475a_{28}y^{(4)}(z)k^{24}+593775a_{30}y^{(6)}(z)k^{24}+10518300a_{32}y^{(8)}(z)k^{2}$$
$$131128140a_{34}y^{(10)}(z)k^{24}-17550a_{27}y^{(4)}(z)k^{23}-475020a_{29}y^{(6)}(z)k^{23}-7888725a_{31}y^{(8)}(z)k^{23}-$$
$$92561040a_{33}y^{(10)}(z)k^{23}-14950a_{26}y^{(4)}(z)k^{22}-376740a_{28}y^{(6)}(z)k^{22}-5852925a_{30}y^{(8)}(z)k^{22}-64512240a_{32}y^{(10)}(z$$
$$548354040a_{34}y^{(12)}(z)k^{22}+12650a_{25}y^{(4)}(z)k^{21}+296010a_{27}y^{(6)}(z)k^{21}+4292145a_{29}y^{(8)}(z)k^{21}+44352165a_{31}y^{(10)}($$
$$354817320a_{33}y^{(12)}(z)k^{21}+10626a_{24}y^{(4)}(z)k^{20}+230230a_{26}y^{(6)}(z)k^{20}+3108105a_{28}y^{(8)}(z)k^{20}+30045015a_{30}y^{(10)}($$
$$225792840a_{32}y^{(12)}(z)k^{20}+1391975640a_{34}y^{(14)}(z)k^{20}-8855a_{23}y^{(4)}(z)k^{19}-177100a_{25}y^{(6)}(z)k^{19}-$$
$$2220075a_{27}y^{(8)}(z)k^{19}-20030010a_{29}y^{(10)}(z)k^{19}-141120525a_{31}y^{(12)}(z)k^{19}-818809200a_{33}y^{(14)}(z)k^{19}-$$
$$7315a_{22}y^{(4)}(z)k^{18}-134596a_{24}y^{(6)}(z)k^{18}-1562275a_{26}y^{(8)}(z)k^{18}-13123110a_{28}y^{(10)}(z)k^{18}-86493225a_{30}y^{(12)}(z)$$
$$471435600a_{32}y^{(14)}(z)k^{18}+2203961430a_{34}y^{(16)}(z)k^{18}+5985a_{21}y^{(4)}(z)k^{17}+100947a_{23}y^{(6)}(z)k^{17}+$$
$$1081575a_{25}y^{(8)}(z)k^{17}+8436285a_{27}y^{(10)}(z)k^{17}+51895935a_{29}y^{(12)}(z)k^{17}+265182525a_{31}y^{(14)}(z)k^{17}+$$
$$1166803110a_{33}y^{(16)}(z)k^{17}+4845a_{20}y^{(4)}(z)k^{16}+74613a_{22}y^{(6)}(z)k^{16}+735471a_{24}y^{(8)}(z)k^{16}+5311735a_{26}y^{(10)}(z)k$$
$$30421755a_{28}y^{(12)}(z)k^{16}+145422675a_{30}y^{(14)}(z)k^{16}+601080390a_{32}y^{(16)}(z)k^{16}+2203961430a_{34}y^{(18)}(z)k^{16}-$$
$$3876a_{19}y^{(4)}(z)k^{15}-54264a_{21}y^{(6)}(z)k^{15}-490314a_{23}y^{(8)}(z)k^{15}-3268760a_{25}y^{(10)}(z)k^{15}-17383860a_{27}y^{(12)}(z)k^{15}-$$
$$77558760a_{29}y^{(14)}(z)k^{15}-300540195a_{31}y^{(16)}(z)k^{15}-1037158320a_{33}y^{(18)}(z)k^{15}-3060a_{18}y^{(4)}(z)k^{14}-$$
$$38760a_{20}y^{(6)}(z)k^{14}-319770a_{22}y^{(8)}(z)k^{14}-1961256a_{24}y^{(10)}(z)k^{14}-9657700a_{26}y^{(12)}(z)k^{14}-40116600a_{28}y^{(14)}(z$$
$$145422675a_{30}y^{(16)}(z)k^{14}-471435600a_{32}y^{(18)}(z)k^{14}-1391975640a_{34}y^{(20)}(z)k^{14}+2380a_{17}y^{(4)}(z)k^{13}+$$
$$27132a_{19}y^{(6)}(z)k^{13}+203490a_{21}y^{(8)}(z)k^{13}+1144066a_{23}y^{(10)}(z)k^{13}+5200300a_{25}y^{(12)}(z)k^{13}+20058300a_{27}y^{(14)}(z$$
$$67863915a_{29}y^{(16)}(z)k^{13}+206253075a_{31}y^{(18)}(z)k^{13}+573166440a_{33}y^{(20)}(z)k^{13}+1820a_{16}y^{(4)}(z)k^{12}+$$
$$18564a_{18}y^{(6)}(z)k^{12}+125970a_{20}y^{(8)}(z)k^{12}+646646a_{22}y^{(10)}(z)k^{12}+2704156a_{24}y^{(12)}(z)k^{12}+9657700a_{26}y^{(14)}(z)k^{1}$$
$$30421755a_{28}y^{(16)}(z)k^{12}+86493225a_{30}y^{(18)}(z)k^{12}+225792840a_{32}y^{(20)}(z)k^{12}+548354040a_{34}y^{(22)}(z)k^{12}-$$
$$1365a_{15}y^{(4)}(z)k^{11}-12376a_{17}y^{(6)}(z)k^{11}-75582a_{19}y^{(8)}(z)k^{11}-352716a_{21}y^{(10)}(z)k^{11}-1352078a_{23}y^{(12)}(z)k^{11}-$$
$$4457400a_{25}y^{(14)}(z)k^{11}-13037895a_{27}y^{(16)}(z)k^{11}-34597290a_{29}y^{(18)}(z)k^{11}-84672315a_{31}y^{(20)}(z)k^{11}-$$
$$193536720a_{33}y^{(22)}(z)k^{11}-1001a_{14}y^{(4)}(z)k^{10}-8008a_{16}y^{(6)}(z)k^{10}-43758a_{18}y^{(8)}(z)k^{10}-184756a_{20}y^{(10)}(z)k^{10}-$$
$$646646a_{22}y^{(12)}(z)k^{10}-1961256a_{24}y^{(14)}(z)k^{10}-5311735a_{26}y^{(16)}(z)k^{10}-13123110a_{28}y^{(18)}(z)k^{10}-$$
$$30045015a_{30}y^{(20)}(z)k^{10}-64512240a_{32}y^{(22)}(z)k^{10}-131128140a_{34}y^{(24)}(z)k^{10}+715a_{13}y^{(4)}(z)k^{9}+$$
$$5005a_{15}y^{(6)}(z)k^{9}+24310a_{17}y^{(8)}(z)k^{9}+92378a_{19}y^{(10)}(z)k^{9}+293930a_{21}y^{(12)}(z)k^{9}+817190a_{23}y^{(14)}(z)k^{9}+$$
$$2042975a_{25}y^{(16)}(z)k^{9}+4686825a_{27}y^{(18)}(z)k^{9}+10015005a_{29}y^{(20)}(z)k^{9}+20160075a_{31}y^{(22)}(z)k^{9}+$$
$$38567100a_{33}y^{(24)}(z)k^{9}+495a_{12}y^{(4)}(z)k^{8}+3003a_{14}y^{(6)}(z)k^{8}+12870a_{16}y^{(8)}(z)k^{8}+43758a_{18}y^{(10)}(z)k^{8}+$$
$$125970a_{20}y^{(12)}(z)k^{8}+319770a_{22}y^{(14)}(z)k^{8}+735471a_{24}y^{(16)}(z)k^{8}+1562275a_{26}y^{(18)}(z)k^{8}+3108105a_{28}y^{(20)}(z)k^{8}$$
$$5852925a_{30}y^{(22)}(z)k^{8}+10518300a_{32}y^{(24)}(z)k^{8}+18156204a_{34}y^{(26)}(z)k^{8}-330a_{11}y^{(4)}(z)k^{7}-1716a_{13}y^{(6)}(z)k^{7}-$$
$$6435a_{15}y^{(8)}(z)k^{7}-19448a_{17}y^{(10)}(z)k^{7}-50388a_{19}y^{(12)}(z)k^{7}-116280a_{21}y^{(14)}(z)k^{7}-245157a_{23}y^{(16)}(z)k^{7}-$$
$$480700a_{25}y^{(18)}(z)k^{7}-888030a_{27}y^{(20)}(z)k^{7}-1560780a_{29}y^{(22)}(z)k^{7}-2629575a_{31}y^{(24)}(z)k^{7}-4272048a_{33}y^{(26)}(z)k$$
$$210a_{10}y^{(4)}(z)k^{6}-924a_{12}y^{(6)}(z)k^{6}-3003a_{14}y^{(8)}(z)k^{6}-8008a_{16}y^{(10)}(z)k^{6}-18564a_{18}y^{(12)}(z)k^{6}-$$

$38760a_{20}y^{(14)}(z)k^6-74613a_{22}y^{(16)}(z)k^6-134596a_{24}y^{(18)}(z)k^6-230230a_{26}y^{(20)}(z)k^6-376740a_{28}y^{(22)}(z)k^6-$
$593775a_{30}y^{(24)}(z)k^6-906192a_{32}y^{(26)}(z)k^6-1344904a_{34}y^{(28)}(z)k^6+126a_9y^{(4)}(z)k^5+462a_{11}y^{(6)}(z)k^5+$
$1287a_{13}y^{(8)}(z)k^5+3003a_{15}y^{(10)}(z)k^5+6188a_{17}y^{(12)}(z)k^5+11628a_{19}y^{(14)}(z)k^5+20349a_{21}y^{(16)}(z)k^5+$
$33649a_{23}y^{(18)}(z)k^5+53130a_{25}y^{(20)}(z)k^5+80730a_{27}y^{(22)}(z)k^5+118755a_{29}y^{(24)}(z)k^5+169911a_{31}y^{(26)}(z)k^5+$
$237336a_{33}y^{(28)}(z)k^5 + 70a_8y^{(4)}(z)k^4 + 210a_{10}y^{(6)}(z)k^4 + 495a_{12}y^{(8)}(z)k^4 + 1001a_{14}y^{(10)}(z)k^4 +$
$1820a_{16}y^{(12)}(z)k^4+3060a_{18}y^{(14)}(z)k^4+4845a_{20}y^{(16)}(z)k^4+7315a_{22}y^{(18)}(z)k^4+10626a_{24}y^{(20)}(z)k^4+$
$14950a_{26}y^{(22)}(z)k^4+20475a_{28}y^{(24)}(z)k^4+27405a_{30}y^{(26)}(z)k^4+35960a_{32}y^{(28)}(z)k^4+46376a_{34}y^{(30)}(z)k^4-$
$35a_7y^{(4)}(z)k^3-84a_9y^{(6)}(z)k^3-165a_{11}y^{(8)}(z)k^3-286a_{13}y^{(10)}(z)k^3-455a_{15}y^{(12)}(z)k^3-680a_{17}y^{(14)}(z)k^3-$
$969a_{19}y^{(16)}(z)k^3-1330a_{21}y^{(18)}(z)k^3-1771a_{23}y^{(20)}(z)k^3-2300a_{25}y^{(22)}(z)k^3-2925a_{27}y^{(24)}(z)k^3-$
$3654a_{29}y^{(26)}(z)k^3-4495a_{31}y^{(28)}(z)k^3-5456a_{33}y^{(30)}(z)k^3-15a_6y^{(4)}(z)k^2-28a_8y^{(6)}(z)k^2-45a_{10}y^{(8)}(z)k^2-$
$66a_{12}y^{(10)}(z)k^2-91a_{14}y^{(12)}(z)k^2-120a_{16}y^{(14)}(z)k^2-153a_{18}y^{(16)}(z)k^2-190a_{20}y^{(18)}(z)k^2-231a_{22}y^{(20)}(z)k^2-$
$276a_{24}y^{(22)}(z)k^2 - 325a_{26}y^{(24)}(z)k^2 - 378a_{28}y^{(26)}(z)k^2 - 435a_{30}y^{(28)}(z)k^2 - 496a_{32}y^{(30)}(z)k^2 -$
$561a_{34}y^{(32)}(z)k^2 + 5a_5y^{(4)}(z)k + 7a_7y^{(6)}(z)k + 9a_9y^{(8)}(z)k + 11a_{11}y^{(10)}(z)k + 13a_{13}y^{(12)}(z)k +$
$15a_{15}y^{(14)}(z)k+17a_{17}y^{(16)}(z)k+19a_{19}y^{(18)}(z)k+21a_{21}y^{(20)}(z)k+23a_{23}y^{(22)}(z)k+25a_{25}y^{(24)}(z)k+$
$27a_{27}y^{(26)}(z)k+29a_{29}y^{(28)}(z)k+31a_{31}y^{(30)}(z)k+33a_{33}y^{(32)}(z)k-by(z)^3+(-a_{34}k^{34}+a_{33}k^{33}+a_{32}k^{32}-a_{31}k^{31}$
$(a_2+k\,(3a_3+k\,(k\,(15a_6+k\,(21a_7+k\,(k\,(45a_{10}+k\,(55a_{11}+k\,(k\,(91a_{14}+k\,(105a_{15}+k\,(k\,(153a$
$a_4y^{(4)}(z)+a_6y^{(6)}(z)+a_8y^{(8)}(z)+a_{10}y^{(10)}(z)+a_{12}y^{(12)}(z)+a_{14}y^{(14)}(z)+a_{16}y^{(16)}(z)+a_{18}y^{(18)}(z)+$
$a_{20}y^{(20)}(z) + a_{22}y^{(22)}(z) + a_{24}y^{(24)}(z) + a_{26}y^{(26)}(z) + a_{28}y^{(28)}(z) + a_{30}y^{(30)}(z) + a_{32}y^{(32)}(z) +$
$a_{34}y^{(34)}(z) = 0$

Constraints on coefficients from imaginary part of equation:

$a_{33} \to 34a_{34}k$

$a_{31} \to 32a_{32}k + 11968a_{34}k^3$

$a_{29} \to 30a_{30}k + 9920a_{32}k^3 + 4452096a_{34}k^5$

$a_{27} \to 28a_{28}k + 8120a_{30}k^3 + 3222016a_{32}k^5 + 1463255552a_{34}k^7$

$a_{25} \to 26a_{26}k + 6552a_{28}k^3 + 2280096a_{30}k^5 + 915512832a_{32}k^7 + 416253167616a_{34}k^9$

$a_{23} \to 24a_{24}k+5200a_{26}k^3+1572480a_{28}k^5+553737600a_{30}k^7+222595276800a_{32}k^9+101219098705920a_{34}k^{11}$

$a_{21} \to 22a_{22}k+4048a_{24}k^3+1052480a_{26}k^5+322058880a_{28}k^7+113541542400a_{30}k^9+45647828828160a_{32}k^{11}+$
$20757378307522560a_{34}k^{13}$

$a_{19} \to 20a_{20}k+3080a_{22}k^3+680064a_{24}k^5+178921600a_{26}k^7+54813158400a_{28}k^9+19326701721600a_{30}k^{11}+$
$7770141612441600a_{32}k^{13} + 3533311737034506240a_{34}k^{15}$

$a_{17} \to 18a_{18}k+2280a_{20}k^3+421344a_{22}k^5+94140288a_{24}k^7+24796428800a_{26}k^9+7597393090560a_{28}k^{11}+$
$2678818983321600a_{30}k^{13} + 1076998764764528640a_{32}k^{15} + 489743069731226910720a_{34}k^{17}$

$a_{15} \to 16a_{16}k+1632a_{18}k^3+248064a_{20}k^5+46387968a_{22}k^7+10376351744a_{24}k^9+2733453598720a_{26}k^{11}+$
$837515820072960a_{28}k^{13}+295306112919306240a_{30}k^{15}+118725592662115614720a_{32}k^{17}+539880259624277272$

$a_{13} \to 14a_{14}k+1120a_{16}k^3+137088a_{18}k^5+21085440a_{20}k^7+3947525120a_{22}k^9+883115778048a_{24}k^{11}+$

$232643283353600a_{26}k^{13}+71280785877073920a_{28}k^{15}+25133441995004313600a_{30}k^{17}+10104710741630858035$

$4594909780970778352680960a_{34}k^{21}$

$a_{11} \to 12a_{12}k+728a_{14}k^3+69888a_{16}k^5+8656128a_{18}k^7+1332930560a_{20}k^9+249576198144a_{22}k^{11}+$

$55834388004864a_{24}k^{13}+14708733593681920a_{26}k^{15}+4506686150828359680a_{28}k^{17}+158904725372420751360$

$6388644615253488618700 80a_{32}k^{21} + 290510499380104682557931520a_{34}k^{23}$

$a_9 \to 10a_{10}k + 440a_{12}k^3 + 32032a_{14}k^5 + 3111680a_{16}k^7 + 385848320a_{18}k^9 + 59422904320a_{20}k^{11} +$

$11126417899520a_{22}k^{13}+2489170300469248a_{24}k^{15}+655734757395660800a_{26}k^{17}+200914020585819340800a_{28}$

$7084182537075441008 6400a_{30}k^{21}+2848142150785340025077760 0a_{32}k^{23}+1295134176935552764188662169 6a$

$a_7 \to 240a_{10}k^3+12672a_{12}k^5+933504a_{14}k^7+90787840a_{16}k^9+11259076608a_{18}k^{11}+1733987205120a_{20}k^{13}+$

$324674387017728a_{22}k^{15}+72635234665365504a_{24}k^{17}+19134668627220889600a_{26}k^{19}+586277175482105462 78$

$2067199948150650018201600a_{30}k^{23}+831102145627092682901815296a_{32}k^{25}+377926640014202589716154417$

$8a_8k$

$a_5 \to 4032a_{10}k^5 + 215424a_{12}k^7 + 15887872a_{14}k^9 + 1545363456a_{16}k^{11} + 191651217408a_{18}k^{13} +$

$29515853365248a_{20}k^{15}+5526593941929984a_{22}k^{17}+1236393972835811328a_{24}k^{19}+325709541934503034880a_{2}$

$9979585956589344915456 0a_{28}k^{23}+351877924559857789131816 96a_{30}k^{25}+14146986524595818866380111872a$

$643305171536314745697706023321 6a_{34}k^{29} + 6a_6k + 112a_8k^3$

$a_3 \to 32640a_{10}k^7+1745920a_{12}k^9+128780288a_{14}k^{11}+12526223360a_{16}k^{13}+1553465966592a_{18}k^{15}+$

$239246490992640a_{20}k^{17}+44796883073761280a_{22}k^{19}+10021832059523170304a_{24}k^{21}+26401021049178161152$

$8089147691031213543260 16a_{28}k^{25}+285221502512012477144760320a_{30}k^{27}+114671153571535605293708738 5$

$5214435313863701306828613536972 8a_{34}k^{31} + 4a_4k + 40a_6k^3 + 896a_8k^5$

$C0 \to a_1-79360a_{10}k^9-4245504a_{12}k^{11}-313155584a_{14}k^{13}-30460116992a_{16}k^{15}-3777576173568a_{18}k^{17}-$

$2a_2k - 581777702256640a_{20}k^{19} - 108932957168730112a_{22}k^{21} - 243701732761644564 48a_{24}k^{23} -$

$641995848494540757401 6a_{26}k^{25}-19670448449104308768604 16a_{28}k^{27}-693575525634287935244206080a_{30}k^2$

$2788468082280054174774659645 44a_{32}k^{31}-12679986192649800541731532727910 4a_{34}k^{33}-8a_4k^3-$

$96a_6k^5 - 2176a_8k^7$

Constraints on coefficients from real part of equation:

$b \to -\frac{14536346904270636646185206945794077480714240000000000a_{34}\chi^{17}}{A^2}$

$a_{32} \to -561a_{34}k^2 - 20145a_{34}$

$a_{30} \to 46376a_{34}k^4 + 9991920a_{34}k^2 + 187358088a_{34}$

$a_{28} \to -1344904a_{34}k^6 - 724414200a_{34}k^4 - 81500768280a_{34}k^2 - 1067783437480a_{34}$

$a_{26} \to 18156204a_{34}k^8 + 18255237840a_{34}k^6 + 5134548401640a_{34}k^4 + 403622139367440a_{34}k^2 +$

$4173852814131276a_{34}$

$a_{24} \to -131128140a_{34}k^{10}-211891153500a_{34}k^8-111248548702200a_{34}k^6-21862865882403000a_{34}k^4-$

$$1356502164592664700a_{34}k^2 - 1186730522077904300a_{34}$$

$$a_{22} \to 548354040a_{34}k^{12}+1299599074800a_{34}k^{10}+109659283720740 0a_{34}k^8+40227673223621520 0a_{34}k^6+$$

$$623990995712625762 00a_{34}k^4 + 327537624093470158680 0a_{34}k^2 + 253969188941370214316 40a_{34}$$

$$a_{20} \to -1391975640a_{34}k^{14}-4548596761800a_{34}k^{12}-5629176564331320a_{34}k^{10}-331878304094877540 0a_{34}k^8-$$

$$960946133397443673480a_{34}k^6-126101985275986011091800a_{34}k^4-586668826454565195070884 0a_{34}k^2-$$

$$417565553658902069241006 00a_{34}$$

$$a_{18} \to 2203961430a_{34}k^{16}+9497070162000a_{34}k^{14}+1620520526095380 0a_{34}k^{12}+140126395062281628 00a_{34}k^{10}-$$

$$652070590519693921290 0a_{34}k^8+159729181349582280716280 0a_{34}k^6+185778461710612311772446600a_{34}k^4+$$

$$793374551951913931557911400 0a_{34}k^2 + 533602762046181236413737395 10a_{34}$$

$$a_{16} \to -2203961430a_{34}k^{18}-12108764456550a_{34}k^{16}-27246114339845400a_{34}k^{14}-3248384612807437740 0a_{34}k$$

$$22170400077669593323860a_{34}k^{10}-872805883803074605342530 0a_{34}k^8-189494030944824558007895532 0a_{34}$$

$$20231051074773805254726740700 0a_{34}k^4-816412225930657291713018214503 0a_{34}k^2-532613660690963990 8$$

$$a_{14} \to 1391975640a_{34}k^{20}+9497070162000a_{34}k^{18}+27246114339845400a_{34}k^{16}+4283584104801016800 0a_{34}k^{14}-$$

$$40309818323035624225200a_{34}k^{12}+2327482356808198947580080 0a_{34}k^{10}+81211727547781953431955228 00a_{3}$$

$$161848408598190442037813925600 0a_{34}k^6+16328244518613145834260364290060 0a_{34}k^4+639136392829156 7$$

$$41493174233847929183266731963206904a_{34}$$

$$a_{12} \to -548354040a_{34}k^{22}-4548596761800a_{34}k^{20}-1620520526095380 0a_{34}k^{18}-3248384612807437740 0a_{34}k^{16}$$

$$40309818323035624225200a_{34}k^{14}-3209104461659789458027080 0a_{34}k^{12}-164228160152181283606842794 40a$$

$$52600732794411893662289525820 00a_{34}k^8-9905801674625308472784621002636 40a_{34}k^6-969356862457554 4$$

$$377587885528016155567727260865182826 4a_{34}k^2-250668473125976412442524305586063058 80a_{34}$$

$$a_{10} \to 131128140a_{34}k^{24}+1299599074800a_{34}k^{22}+5629176564331320a_{34}k^{20}+140126395062281628 00a_{34}k^{18}+$$

$$22170400077669593323860a_{34}k^{16}+2327482356808198947580080 0a_{34}k^{14}+164228160152181283606842794 40a$$

$$771477414318041107046913045360 0a_{34}k^{10}+233493896616167985429923209347858 0a_{34}k^8+426517019481323$$

$$4153466740808177711244999869517011090 4a_{34}k^4+16544119226314443221206604168680161880 80a_{34}k^2+$$

$$1159015378339974376023654191886503993681 2a_{34}$$

$$a_{8} \to -18156204a_{34}k^{26}-211891153500a_{34}k^{24}-1096592837207400a_{34}k^{22}-331878304094877540 0a_{34}k^{20}-$$

$$652070590519693921290 0a_{34}k^{18}-872805883803074605342530 0a_{34}k^{16}-812117275477819534319552280 0a_{34}k$$

$$52600732794411893662289525820 00a_{34}k^{12}-233493896616167985429923209347858 0a_{34}k^{10}-685473781309 27$$

$$1246040022242453313373499960855103327 12a_{34}k^6-124080894197358324159049531265101214106 00a_{34}k^4-$$

$$52155692025298846921064438634892679715654 0a_{34}k^2-401229236459707124151708647359481867261742 0a$$

$$a_{6} \to 1344904a_{34}k^{28}+18255237840a_{34}k^{26}+111248548702200a_{34}k^{24}+40227673223621520 0a_{34}k^{22}+$$

$$960946133397443673480a_{34}k^{20}+159729181349582280716280 0a_{34}k^{18}+189494030944824558007895532 0a_{34}k^{1}$$

$$161848408598190442037813925600 0a_{34}k^{14}+990580167462530847278462100263640a_{34}k^{12}+426517019481323$$

$$1246040022242453313373499960855103327 12a_{34}k^8+231617669168402205096892458361522266331 20a_{34}k^6+$$

$$243393229451394618964967380296165838673052 0a_{34}k^4+1123441862087179947624784212606549228332877$$
$$100349034908661099170743696567098292840009514 4a_{34}$$
$$a_4 \to -46376a_{34}k^{30} - 724414200a_{34}k^{28} - 5134548401640a_{34}k^{26} - 21862865882403000a_{34}k^{24} -$$
$$623990995712625762 00a_{34}k^{22}-126101985275986011091800a_{34}k^{20}-185778461710612311772446600a_{34}k^{18}-$$
$$202310510747738052547267407000a_{34}k^{16}-163282445186131458342603642900600a_{34}k^{14}-969356862457554$$
$$415346674080817771124499986951701109 04a_{34}k^{10}-124080894197358324159049531265101214106 00a_{34}k^8-$$
$$243393229451394618964967380296165838673052 0a_{34}k^6-280860465521794986906196053151637307083219 4$$
$$150523552362991648756115544850647439260014271 60a_{34}k^2-170726346270331091757891680875639210608$$
$$a_2 \to 561a_{34}k^{32}+9991920a_{34}k^{30}+81500768280a_{34}k^{28}+403622139367440a_{34}k^{26}+135650216459266470 0a_{34}k^{24}$$
$$327537624093470158680 0a_{34}k^{22}+586668826454565195070884 0a_{34}k^{20}+793374551951913931557911400 0a_{34}k$$
$$816412225930657291713018214503 0a_{34}k^{16}+639136392829156789050337229886600 0a_{34}k^{14}+3775878855280 1$$
$$165441192263144432212066041686801618808 0a_{34}k^{10}+521556920252988469210644386348926797156540a_{34}k$$
$$112344186208717994762478421260654922833287760a_{34}k^6+150523552362991648756115544850647439260 01$$
$$102435807762198655054735008525383526365134639800 0a_{34}k^2+176278245338580380260381488802458855 1$$
$$\omega \to -a_1k+33a_{34}k^{34}+624495a_{34}k^{32}+5433384552a_{34}k^{30}+28830152811960a_{34}k^{28}+104346320353281900a_{34}k^2$$
$$272948020077891798900a_{34}k^{24}+533335296776877450064440a_{34}k^{22}+793374551951913931557911400a_{34}k^{20}+$$
$$907124695478508101903353571670a_{34}k^{18}+798920491036445986312921537358250a_{34}k^{16}+539411265040023 0$$
$$275735320438574053686776736144669364680a_{34}k^{12}+104311384050597693842128877269785359431308a_{34}k^1$$
$$280860465521794986906196053151637307083219 40a_{34}k^8+501745174543305495853718482835491464200047$$
$$512179038810993275273675042626917631825673199000a_{34}k^4+176278245338580380260381488802458855 19$$
$$831075336312307681886333504833057977075395375390625a_{34}$$

y(z) - function:

$$\frac{17179869184a^{17}A}{(4a^2e^z + \chi e^{-z})^{17}}$$

u(x, t) - function:

$$\frac{17179869184a^{17}Ae^{i(kx-\omega t)}}{(4a^2e^{\mathrm{C0}t+x} + \chi e^{-\mathrm{C0}t-x})^{17}}$$